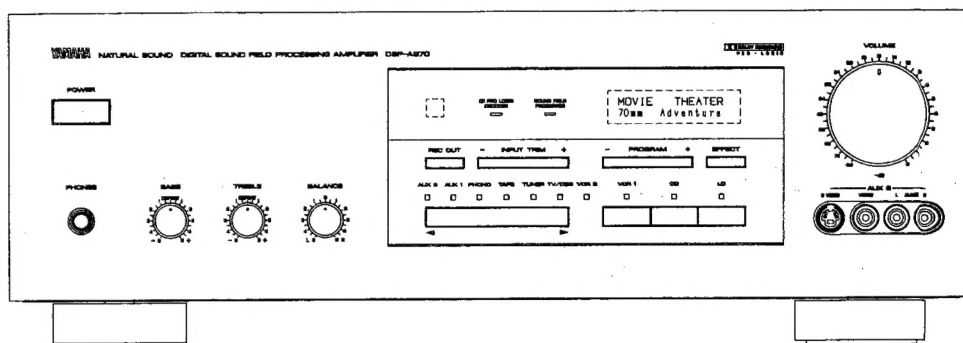
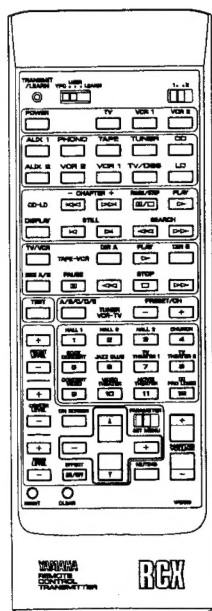


# DIGITAL SOUND FIELD PROCESSING AMPLIFIER

# DSP-A970

## SERVICE MANUAL



### IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that all service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

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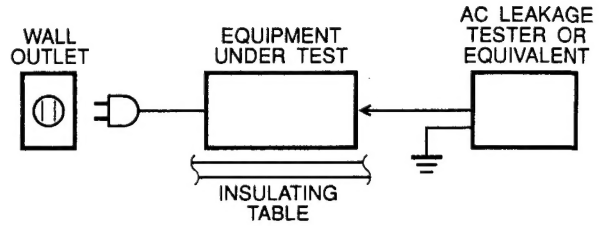
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100464

**YAMAHA**  
YAMAHA CORPORATION  
P.O.Box 1, Hamamatsu, Japan  
3.0K-293 Printed in Japan '93.7

## ■ TO SERVICE PERSONNEL

1. Critical Components Information.  
Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Models Only).  
When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.
  - Meter impedance should be equivalent to 1500 ohm shunted by 0.15 $\mu$ F.
  - Leakage current must not exceed 0.5mA.
  - Be sure to test for leakage with the AC plug in both polarities.



## WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

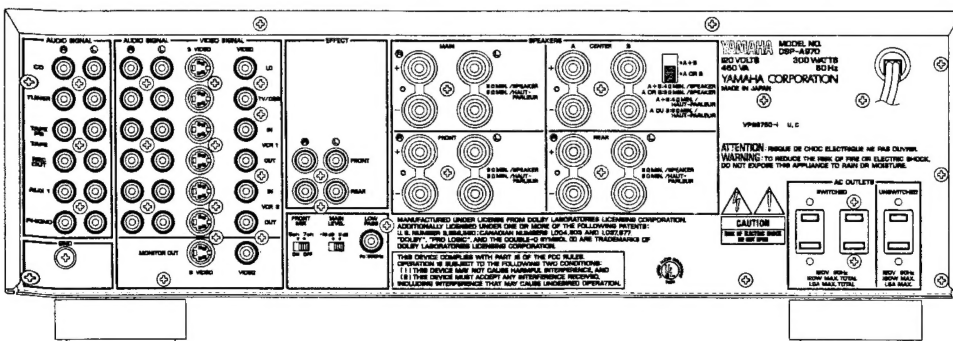
DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

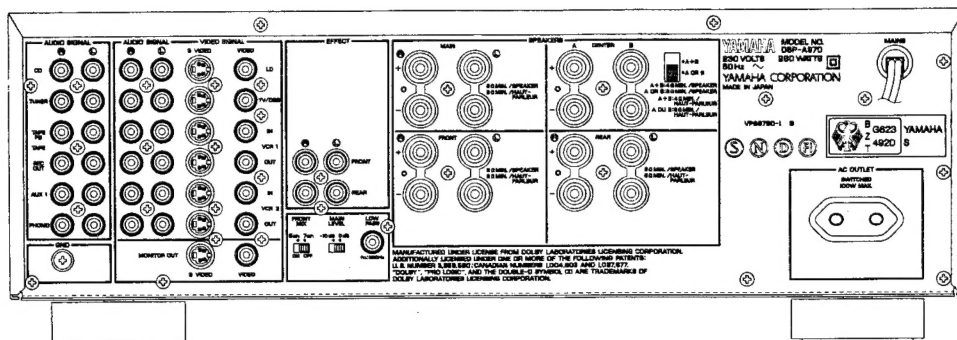
If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## ■ REAR PANELS

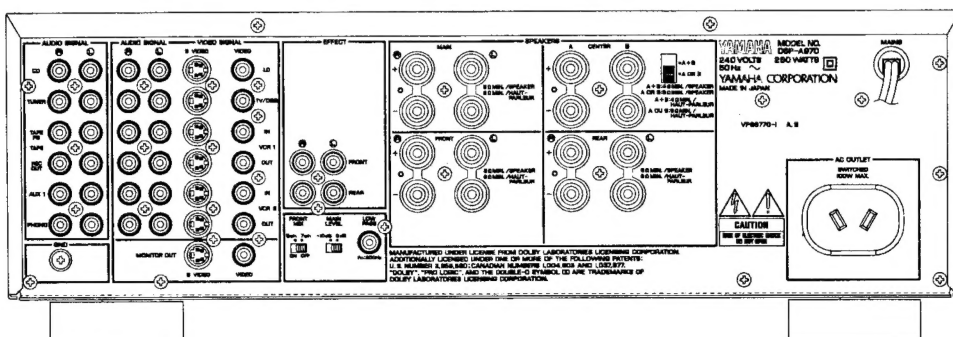
### ▼ USA & Canadian models



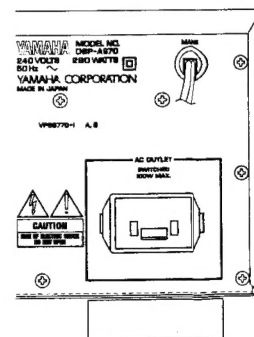
▼ European model



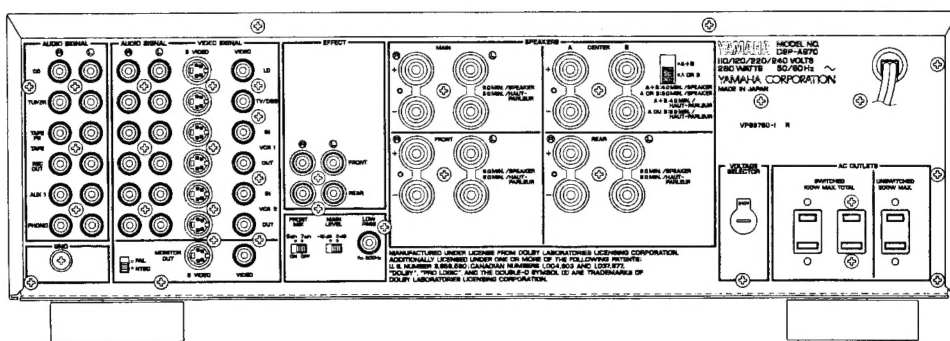
▼ Australian & British models



British model only



▼ General model



## SPECIFICATIONS

<b>Minimum RMS Output Power Per Channel</b>		
Main, Center (20Hz—20kHz 0.015% THD 8Ω/6Ω)		
(U, C models)	65W/80W	
(R, A, B, G models)	60W/75W	
Front, Rear Effect (20Hz—20kHz 0.03% THD 8Ω/6Ω)	22W/25W	
<b>Dynamic Power Per Channel (U, C models)</b> (by IHF Dynamic Headroom Measuring Method)		
Main (8Ω/6Ω/4Ω)	85W/105W/130W	
<b>DIN Standard Output Power Per Channel (G model)</b>		
Main (1kHz 0.7% THD 4Ω)	105W	
<b>Dynamic Headroom (U, C models)</b>		
Main (8Ω/6Ω)	1.2dB/1.2dB	
<b>IEC Power (G model)</b>		
Main (1kHz 0.015% THD 8Ω/6Ω)	65W/80W	
<b>Damping Factor</b>		
Main, Center (1kHz 8Ω)	100	
<b>Input Sensitivity/Impedance</b>		
Phono MM	2.5mV/47kΩ	
CD etc	150mV/47kΩ	
<b>Maximum Input Signal (1kHz)</b>		
Phono MM (0.01% THD)	130mV	
CD etc (EFFECT ON 0.5% THD)	2.3V	
<b>Output Level/Impedance</b>		
REC OUT (PHONO)	150mV/1kΩ	
PRE OUT (FRONT L, R, REAR L, R)	1V/1.2kΩ	
PRE OUT (LOW PASS)	4.0V/3.3kΩ	
<b>Headphone Jack Rated Output/Impedance</b>		
Input 50mV RL=8Ω	0.19V	
Impedance	100Ω	
<b>Frequency Response (20Hz—20kHz)</b>		
CD etc	0±1.0dB	
<b>RIAA Equalization Deviation (20Hz—20kHz)</b>		
Phono MM	0±0.5dB	
<b>Total Harmonic Distortion (20Hz—20kHz)</b>		
Phono MM to REC OUT, 1V	0.01%	
CD etc. to SP out (MAIN L, R) 35W/8Ω	0.02%	
<b>Signal-to-Noise Ratio (IHF-A Network)</b>		
Phono MM (Input Shorted)	More than 86dB	
CD etc (Input Shorted)	More than 96dB	
<b>Residual Noise (IHF-A Network)</b>		
MAIN L, R SP out	150μV	
<b>Channel Separation (Vol -30dB)</b>		
Phono MM Input shorted		
1kHz/10kHz	More than 65dB/50dB	
CD etc Input 5.1kΩ Terminated		
1kHz/10kHz	More than 60dB/45dB	
<b>Tone Control Characteristics</b>		
Bass Boost/Cut	±10dB (50Hz)	
Turnover frequency	350Hz	
Treble Boost/Cut	±10dB (20kHz)	
Turnover frequency	3.5kHz	
<b>Filter Characteristics (LOW PASS)</b>		
High cut Filter	fc=200Hz, 6dB/oct	
<b>Audio Muting</b>		
	-20dB	
<b>Video</b>		
Video Signal Type	(U, C models)	NTSC
	(A, B, G models)	PAL
	(R model)	NTSC/PAL

Video Signal Level	1Vp-p75Ω
S-Video Signal Level	Y 1Vp-p75Ω
	C 0.286Vp-p75Ω
Maximum Input Level	More than 1.5Vp-p
S/N	50dB
Monitor Out Frequency response	5Hz—10MHz, -3dB

<b>Power Supply</b>	
U, C models	AC120V 60Hz
A, B models	AC240V 50Hz
G model	AC230V 50Hz
R model	AC110/120/220/240V 60/50Hz

<b>Power Consumption</b>	
U, C models	300W, 460VA
A, B, G, R models	280W

<b>AC Outlets</b>	
2 Switched Outlets	
(U, C models)	120W max. total
(R model)	100W max. total
1 Switched Outlets	
(A, B, G models)	100W max. total
1 Unswitched Outlets	
(U, C models)	180W max.
(R model)	200W max.

<b>Dimensions (W x H x D)</b>	435 x 151.5 x 408.5mm (17-1/8" x 5-15/16" x 16-1/16")
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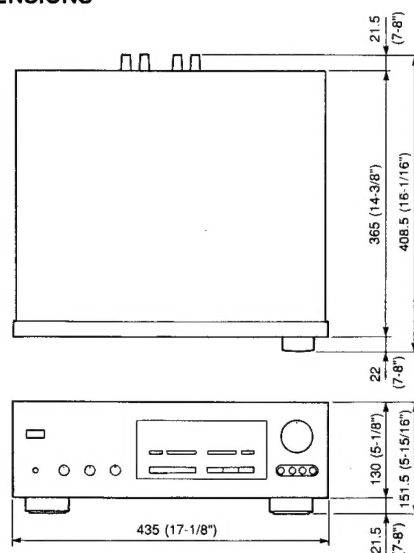
<b>Weight</b>	14.0kg (30 lbs. 13 oz)
---------------	------------------------

\*Specifications are subject to change without notice.

U ..... U. S. A. model	A ..... Australian model
C ..... Canadian model	G ..... European model
B ..... British model	R ..... General model

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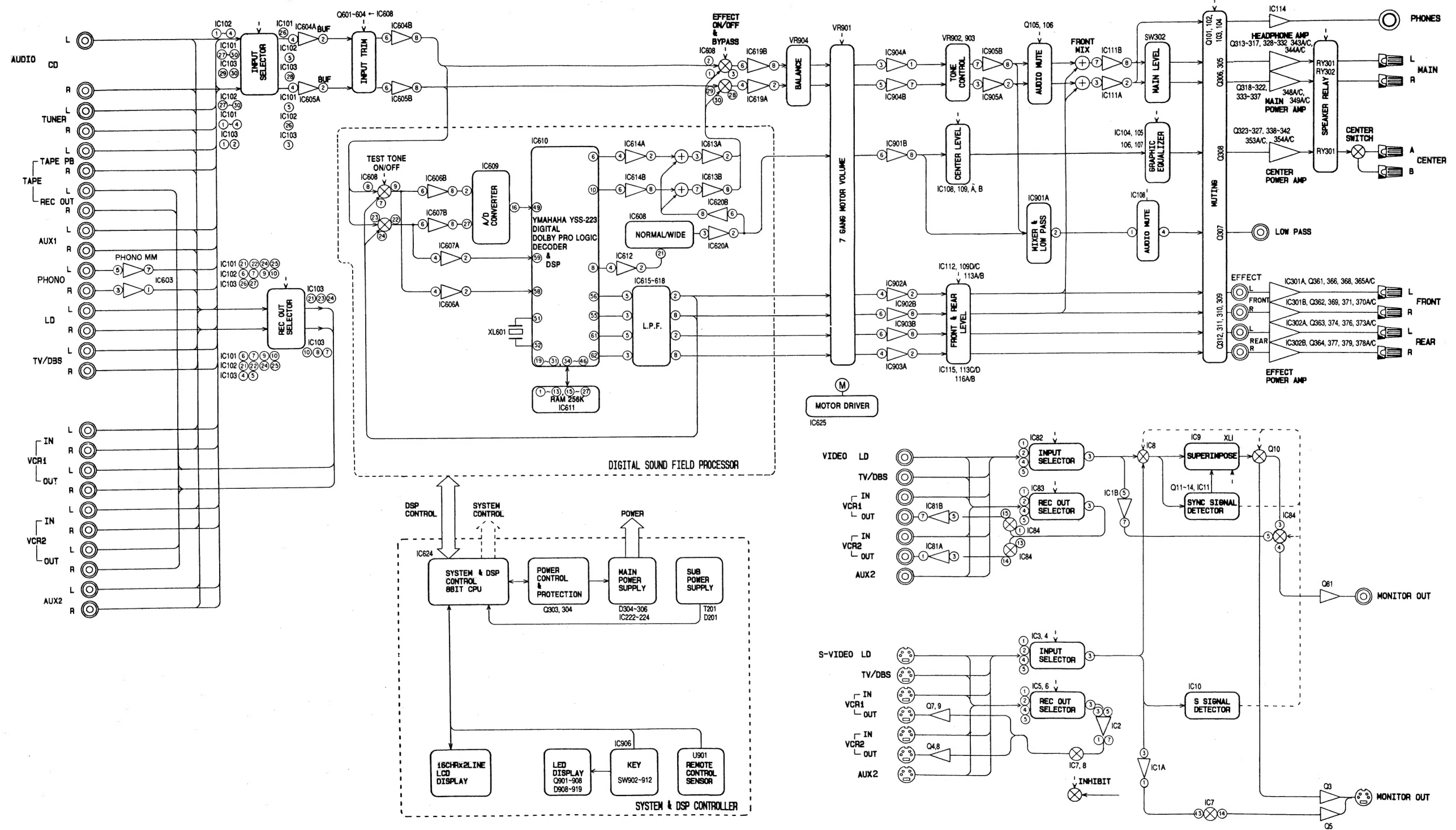
## DIMENSIONS



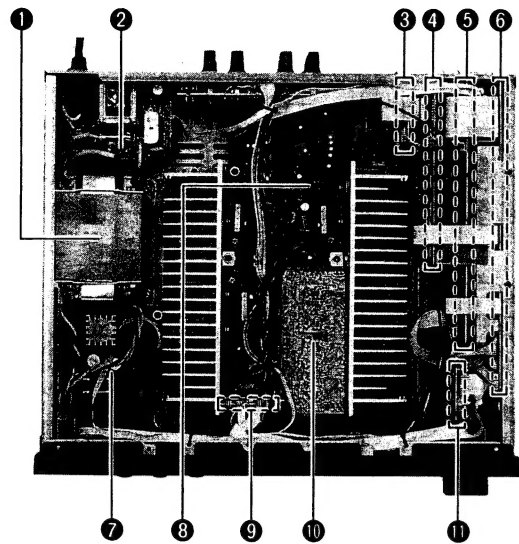
Unit : mm (inch)



■ BLOCK DIAGRAM



■ INTERNAL VIEW



- ① POWER TRANSFORMER
- ② FUNCTION P.C.B. ASS'Y (4)
- ③ FUNCTION P.C.B. ASS'Y (3)
- ④ FUNCTION P.C.B. ASS'Y (2)
- ⑤ FUNCTION P.C.B. ASS'Y (1)
- ⑥ DSP P.C.B. ASS'Y
- ⑦ MAIN P.C.B. ASS'Y (5)
- ⑧ MAIN P.C.B. ASS'Y (1)
- ⑨ FUNCTION P.C.B. ASS'Y (5)
- ⑩ MAIN P.C.B. ASS'Y (3)
- ⑪ OPERATION P.C.B. ASS'Y (3)

■ DISASSEMBLY PROCEDURES

(Remove parts in disassembly order as numbered.)

1. Removal of Top Cover

- a. Remove 4 screws (①) and 2 screws (②) and then remove the Top Cover in Fig. 1.

2. Removal of Bottom Cover

- a. Remove 9 screws (③) and then remove the Bottom Cover in Fig. 1.

3. Removal of Front Panel

- a. Remove 4 knobs in Fig. 1.
- b. Remove 6 screws (④) and then the remove the Front Panel in Fig. 1. For this removal, also remove connectors (#4 to #6, #21, #23) as necessary. (Refer to Fig. 3 Bottom Side Wire Connection Diagram.)

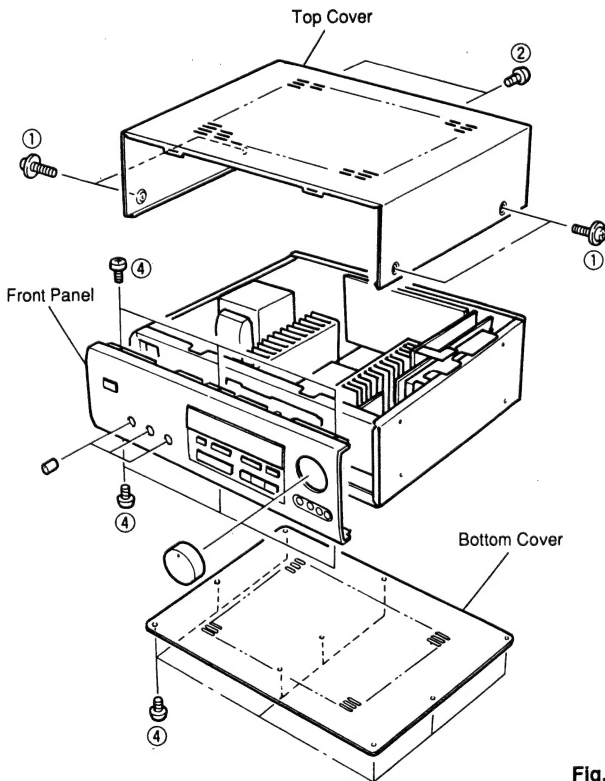
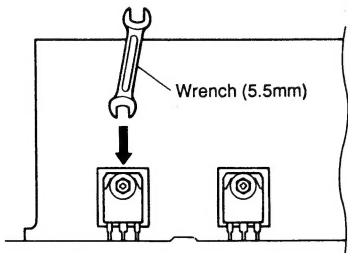


Fig. 1

Removal of Power Transistor

- a. Use a 5.5mm wrench or a small size adjustable wrench.
- b. Using the above tool, remove the screw fixing the Power Transistor.



4. Removal of DSP P.C.B.

- a. Remove 8 screws (⑤) and 3 plastic rivets (⑥) in Fig. 2.
- b. Remove the connector bands (#3, #7, #8) in Fig. 3.
- c. Remove the connectors (#1, #15, #21 to #23) in Fig. 3.
- d. Move the DSP P.C.B. toward the front and pull it up.

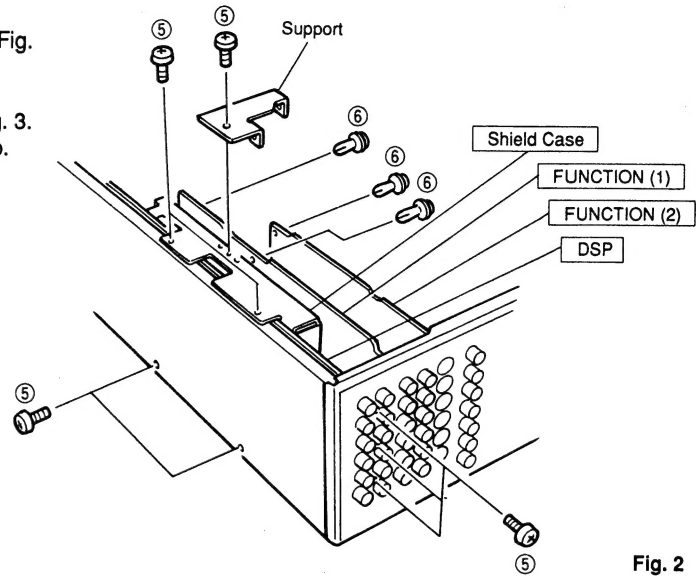


Fig. 2

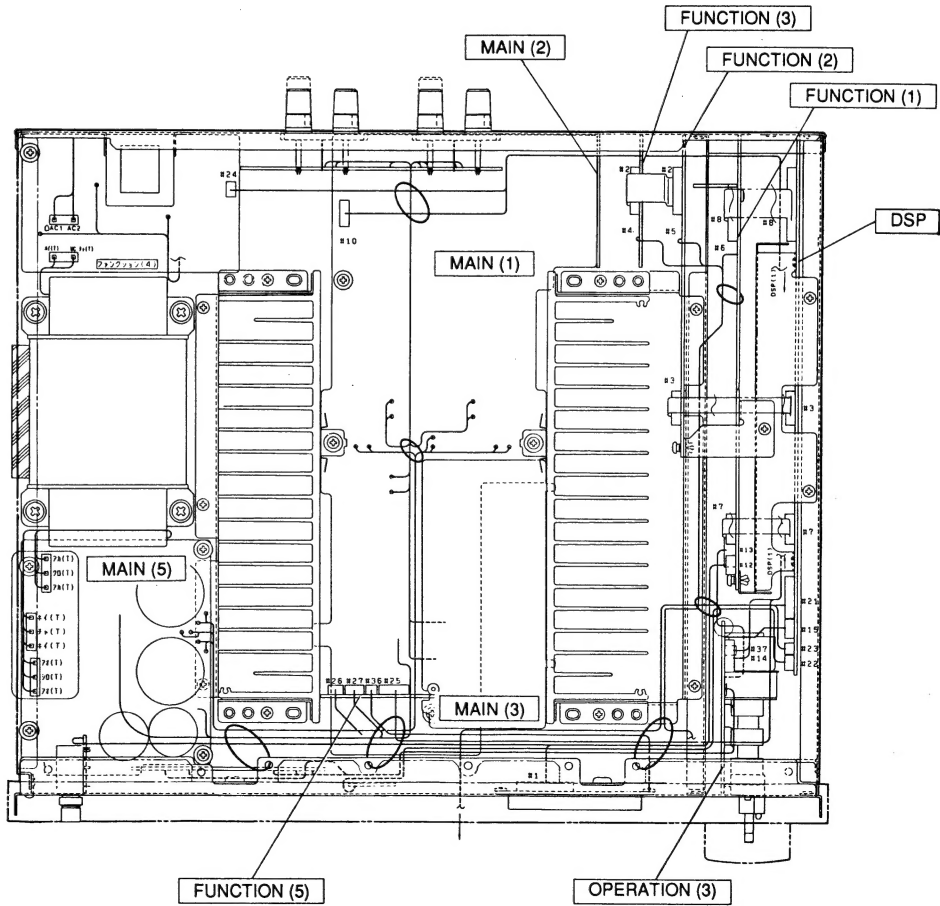


Fig. 3

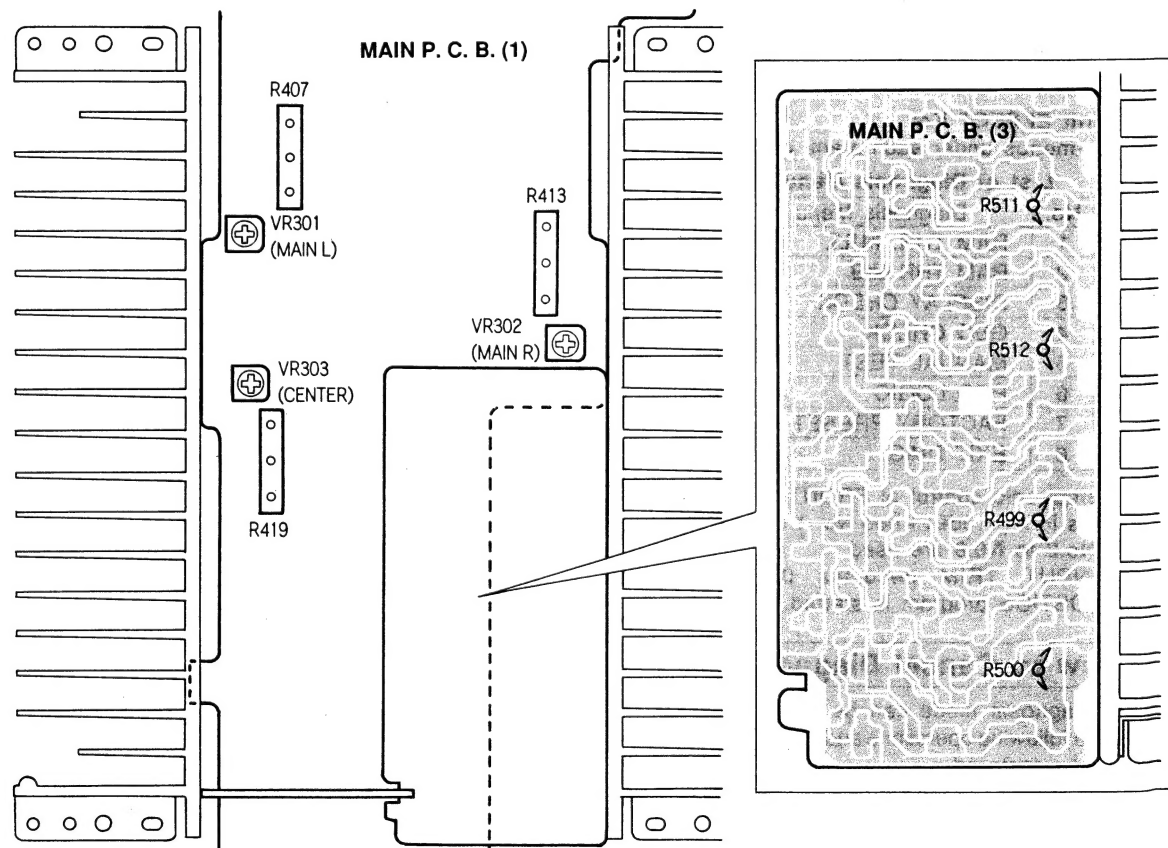
## ■ ADJUSTMENTS

### ● IDLING CURRENT ADJUSTMENT

Before this adjustment, wait for 10 minutes with no signal applied after the power is turned ON.

Item	Test Point	Adjustment point	Rating (DC)
MAIN L	Between terminals of R407, at the center and one end	VR301	2.5mV~5mV
MAIN R	Between terminals of R413, at the center and one end	VR302	
CENTER	Between terminals of R419, at the center and one end	VR303	
FRONT L	Between terminals of R499 at both ends	—	100mV~300mV
FRONT R	Between terminals of R500, at both ends	—	
REAR L	Between terminals of R511, at both ends	—	
REAR R	Between terminals of R512, at both ends	—	

### ● Test Point



## ■ DIAGNOSTICS MODE

The DSP-A970 is provided with a self-diagnosis program called "DIAGNOSTICS" mode which facilitates inspection and measurement. Described below are its operation procedure and diagnosis content.

### 1. How to Start Diagnosis

While pressing 2 keys "REC OUT" and "INPUT TRIM-" on the main panel of the DSP-A970 simultaneously, turn ON the power. This sets the unit in the "DIAGNOSTICS" mode and starts operation and then the following message appears on the LCD.

1. RAM THR. FULL  
EXTERNAL A/D

There are 8 menus (No.1 to No.8) in the 'DIAGNOSTICS' mode and each of them has some sub-menus. Selection of these menus and sub-menus can be made as follows.

- **Remote Control PROGRAM No.1 to No.8 Keys**  
Menus No.1 to No.8 can be selected directly. Also, pressing the same No. key a number of times will allow the sub-menu to be selected.
- **Main Unit PROGRAM +/- Key**  
The menu can be shifted up and down among No.1 to No.8.
- **Main Unit EFFECT Key**  
The sub-menus under each menu can be selected.

#### List of Diagnosis Menus

No.	Diagnosis Menu
1	RAM THR. FULL
2	RAM THR.0dB
3	DISPLAY CHECK
4	GEQ CHECK
5	MANUAL TEST
6	PRO LOGIC
7	FACTORY PRESET
8	EXIT DIAG.

- \*1 Each electronic control of FRONT/REAR/CENTER becomes Full (+10dB) when No. 1 is used and 0dB when No.2 to No.8 are used.
- \*2 The INPUT TRIM becomes 0dB when the DIAGNOSTICS program is started.

### 2. How to Cancel Diagnosis

The self-diagnosis mode can be cancelled by using either of the following operations and the normal operation mode will be restored.

- Turn OFF the power.
- Execute Diag. Menu No.8 "EXIT DIAG."

When initializing the RAM, select Diag. Menu no.7 "FACTORY PRESET" and in the "RESERVED" state, cancel the diagnostics mode.

### 3. Content of Diagnosis

#### — No.1 RAM THR. FULL —

DSP RAM THROUGH

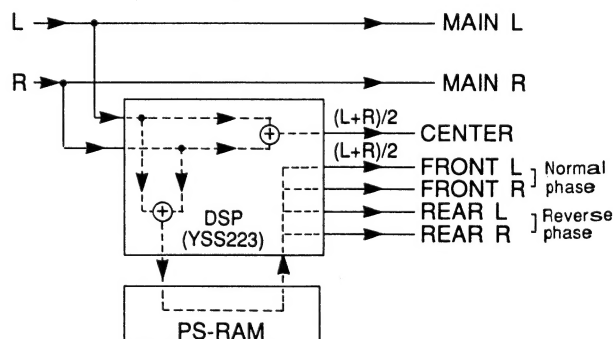
—Signals of each channel are processed as follows.

- MAIN L/R : Output provided by bypassing the DSP-LSI.
- CENTER : Output provided after  $(L + R)$  divided by 2 in the DSP.
- FRONT/REAR : Output provided in the normal phase for FRONT and in the reverse phase for REAR after  $(L + R)$  divided by 2 in the DSP and through the PS-RAM

Also, each electronic control of FRONT/REAR/CENTER becomes Full (+10dB).

In addition, the A/D converter to use can be switched by using a sub-menu.

EXTERNAL A/D : A/D (IC604) attached outside is used.  
INTERNAL A/D : A/D built in the DSP-LSI is used.



DSP RAM THROUGH SIGNAL PATH DIAGRAM

#### — No.2 - RAM THR.0dB —

The same as No.1 except that the electronic control is set to 0dB.

#### — No.3 - DISPLAY CHECK —

Segment check of the LED and LCD.

On the LED,

PRO LOGIC → SOUND FIELD → AUX3 → ... → CD → LD  
DECORDER PROCESSOR

light in that order at about 0.5 seconds intervals and finally all segments in the LED and LCD light.

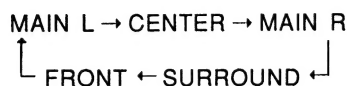
#### — No.4 - GEQ CHECK —

Function to check the Center Graphic Equalizer easily. According to the sub-menu selection, the graphic equalizer setting changes in the order of :

ALL FLAT → 100Hz+6dB → 300Hz+6dB  
↑ ↓  
10kHz+6dB ← 3kHz+6dB ← 1kHz+6dB

### — No.5 - MANUAL TEST —

Test noise output mode by manual operation.  
According to the sub-menu selection the test noise output changes in the order of :



Use of the AUDIO MUTE will set the level of each channel to -20dB.

### — No.6 - PRO LOGIC —

DOLBY PRO LOGIC in the state of AUTO INPUT BALANCE OFF.

By using sub-menus, EFFECT OFF (BYPASS) , CENTER MODE NORMAL/WIDE/PHANTOM can be selected.

### — No.7 - FACTORY PRESET —

Initialization of each memory is selected by using the sub-menu.

RESERVED : Initialization of the memory is executed after the diagnosis has been done.

INHIBIT : Initialization of the memory is inhibited. Parameters, Electronic VOL, GEQ and Center mode settings are restored as they were before starting diagnosis.

### — No.8 - DIAG. EXIT —

When the "EFFECT" key is pressed, the self-diagnosis mode will be cancelled and the mode will be set back to the normal operation mode.

## ■ PROTECTION FUNCTION

The protection function is activated and the power turns OFF when :

1. DC occurs in the output of any power amplifier channel.
2. An abnormal current flows to any power amplifier due to such a reason as a short circuit in the speaker
3.  $\pm 15V$  is abnormal
4.  $\pm 5V$  is abnormal
5.  $\pm B$  is abnormal

Also , there are cases when the power is turned OFF due to an error in detecting the above conditions or abnormality in the protection circuit itself.

The protection circuit consists of a microcomputer (IC624), Q607, 608 and a peripheral diode.

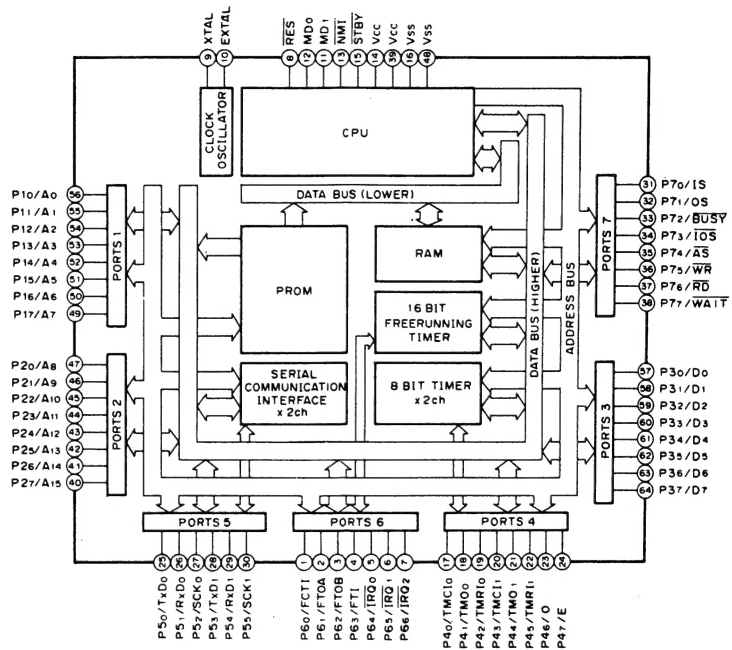
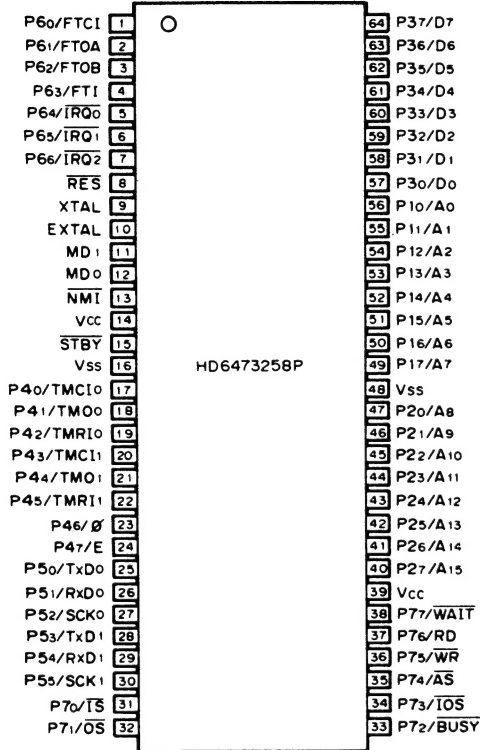
The function of each element is as follows.

- a) Q607, 608 : Detecting abnormality and sending that signal to the microcomputer (IC624)
- b) PRT (7) terminal of microcomputer (IC624)  
: Input terminal of the signal from Q607, 608
- c) PWR (42) terminal of microcomputer (IC624)  
: Output terminal for the signal to the power ON/OFF relay
- d) SRY (22) terminal of microcomputer (IC624)  
: Output terminal for the ON/OFF signal to the speaker protection relay

The microcomputer and interface does not detect abnormality for 3 or 4 seconds after the power is turned ON. During this time, abnormality can be located by checking the above listed conditions 1 to 5. Before this check, however, make sure to check that there is no danger or smoke.

## IC DATA

IC624 : HD6473258P10  
8 bit  $\mu$ -COM



No.	Name	Function	POWER ON	POWER OFF	BUCK UP
1	P60-INH2	V-REC 2 inhibit (VCR 2)	O	OL	→
2	P61-INH1	V-REC 1 inhibit (VCR 1)	O	OL	→
3	P62-IE	INT/EXT detect	I (pu)	I	I
4	P63-ADR	AK5339 RESET	O	OL	→
5	P64-REM	Remote control input interrupt	I	→	→
6	P65-PDET	Power detect interrupt	I	→	→
7	P66-PRTC	Protection detect	I	→	→
8	RES	RESET			
9	XTAL	20MHz			
10	EXTAL	OSC			
11	MD1	H			
12	MD0	H			
13	NMI	H			
14	VCC	+5V			
15	SYBY	H			

Note) In the above table, — means negative logic and (pu) the internal pulled-up state.

No.	Name	Function	POWER ON	POWER OFF	BUCK UP
16	VSS	GND			
17	P40-P/N	PAL/NTSC detect	I (pu)	→	I
18	P41-CLKG	GEQ clock	O	OL	→
19	P42-TXDG	GEQ data	O	OL	→
20	P43-CE0	GEC, DSP	O	OL	→
21	P44-CE1	CE	O	OL	→
22	P45-SPR	Speaker relay	O	OL	→
23	P46-FMX	FRONT MIX	I (pu)	→	I
24	P47-FMT	FULL MUTE	O	OL	→
25	P50-TXD0	Serial data	O	OL	→
26	P51-CESI	On screen CE	O	OL	→
27	P52-SCK0	Serial clock		OL	→
28	P53-TXD1	DSP serial data	O	OL	→
29	P54-CRS	DSP reset	O	OL	→
30	P55-SCK1	DSP serial clock		OL	→
31	P70-LCD0	VCD DATA 0	O	OL	→
32	P71-LCD1	VCD DATA 1	O	OL	→
33	P72-LCD2	VCD DATA 2	O	OL	→
34	P73-LCD3	VCD DATA 3	O	OL	→
35	P74-LCD4	VCD DATA 4	O	OL	→
36	P75-LCD5	VCD DATA 5	O	OL	→
37	P76-LCD6	VCD DATA 6	O	OL	→
38	P77-LCD7	VCD DATA 7	O	OL	→
39	VCC	+5V			
40	P27-CEL	LCD CE	O	OL	→
41	P26-RS	LCD RS	O	OL	→
42	P25-PWR	Power relay	OH	OL	→
43	P24-VLD	VOLUME DOWN	O	OL	→
44	P23-VLU	VOLUME UP	O	OL	→
45	P22-IND	VOLUME LED	O	I	→
46	P21-STBY	STANDBY LED	OH	O	→
47	P20-PWR	Power relay reverse	OL	I	→
48	VSS	GND			
49	P17-K2	KEY 2 (unused)	I	→	→
50	P16-K1	KEY 1	I	→	→
51	P15-K0	KEY 0	I	→	→
52	P14-LED1	LED 1	O	OL	→
53	P13-LED0	LED 0	O	OL	→
54	P12-D2	DIGIT 2	O	OL	→
55	P11-D1	DIGIT 1	O	OL	→
56	P10-D0	DIGIT 0	O	OL	→
57	P30-VER0	Specifications 0 (H : G, R)	I (pu)	→	I
58	P31-VER1	Specifications 1 (H : U, R)	I (pu)	→	I
59	P32-PSW	POWER SW	I	→	→
60	P33-HMT	Headphone MUTE	O	OL	→
61	P34-HDET	Headphone detect	I (pu)	→	I
62	P35-VSL C	VIDEO C	O	OL	→
63	P36-VSL B	VIDEO B	O	OL	→
64	P37-VSL A	VIDEO A	O	OL	→

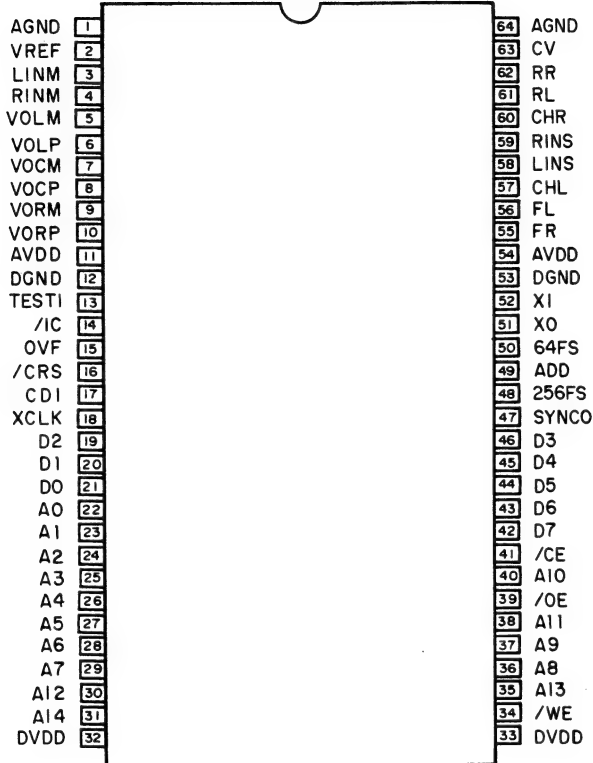
Note) In the above table, — means negative logic and (pu) the internal pulled-up state.



## DSP-A970

IC610 : YSS223-K

Digital Dolby Pro Logic Decoder with Auto Input Balance



Pin No.	Pin Name	I/O	Function
1	AGND	A—	Ground (Analog section)
2	VREF	AI	Multiplaying DAC reference voltage input
3	LINM	AI	L channel Multiplaying DAC input
4	RINM	AI	R channel Multiplaying DAC input
5	VOLM	AO	L channel operation amplifier, connected to (–) terminal
6	VOLP	AO	L channel operation amplifier, connected to (+) terminal
7	VOCM	AO	C channel operation amplifier, connected to (–) terminal
8	VOCP	AO	C channel operation amplifier, connected to (+) terminal
9	VORM	AO	R channel operation amplifier, connected to (–) terminal
10	VORP	AO	R channel operation amplifier, connected to (+) terminal
11	AVDD	A—	+5V power supply (Analog section)
12	DGND	—	Ground (digital section)
13	TESTI	Ic	LSI test terminal Normally connected to DGND
14	/IC	Ics	Initial clear terminal (Power ON resetting is necessary)
15	OVF	O	A/D Converter, Overflow detect terminal
16	CRS	Ils	Microprocessor interface reset terminal
17	CDI	Ils	Microprocessor interface data input terminal
18	XCLK	Ils	Microprocessor interface clock input terminal
19	D2	I/Ot	External delay RAM data terminal
20	D1	I/Ot	External delay RAM data terminal

Pin No.	Pin Name	I/O	Function
21	D0	I/Ot	External delay RAM data terminal
22	A0	O	External data RAM address terminal
23	A1	O	External data RAM address terminal
24	A2	O	External data RAM address terminal
25	A3	O	External data RAM address terminal
26	A4	O	External data RAM address terminal
27	A5	O	External data RAM address terminal
28	A6	O	External data RAM address terminal
29	A7	O	External data RAM address terminal
30	A12	O	External data RAM address terminal
31	A14	O	External data RAM address terminal
32	DVDD	—	+5V power supply (digital section)
33	DVDD	—	+5V power supply (digital section)
34	/WE	O	External delay RAM write enable terminal
35	A13	O	External delay RAM address terminal
36	A8	O	External delay RAM address terminal
37	A9	O	External delay RAM address terminal
38	A11	O	External delay RAM address terminal
39	/OE	O	External delay RAM output enable terminal
40	A10	O	External delay RAM address terminal
41	/CE	O	External delay RAM chip enable terminal
42	D7	I/Ot	External delay RAM data terminal
43	D6	I/Ot	External delay RAM data terminal
44	D5	I/Ot	External delay RAM data terminal
45	D4	I/Ot	External delay RAM data terminal
46	D3	I/Ot	External delay RAM data terminal
47	SYNCO	O	External A/D converter word clock terminal
48	256FS	O	External A/D converter 256fs clock terminal
49	ADD	It	External A/D converter data input terminal
50	64FS	O	External A/D converter 64fs clock terminal
51	XO	O	Crystal oscillator connecting terminal
52	XI	I	Crystal oscillator connecting terminal
53	DGND	—	Ground (digital section)
54	AVDD	A—	+5V power supply (Analog section)
55	FR	AO	FR channel D/A input
56	FL	AO	FL channel D/A output
57	CHL	A—	LINS input Sample/hold Capacitor external terminal
58	LINS	AI	L channel A/D input
59	RINS	AI	R channel A/D input
60	CHR	A—	RINS input Sample/hold Capacitor external terminal
61	RL	AO	RL channel D/A output
62	RR	AO	RR channel D/A input
63	CV	AO	A/D, multiplying DAC center voltage
64	AGND	A—	Ground (Analog section)

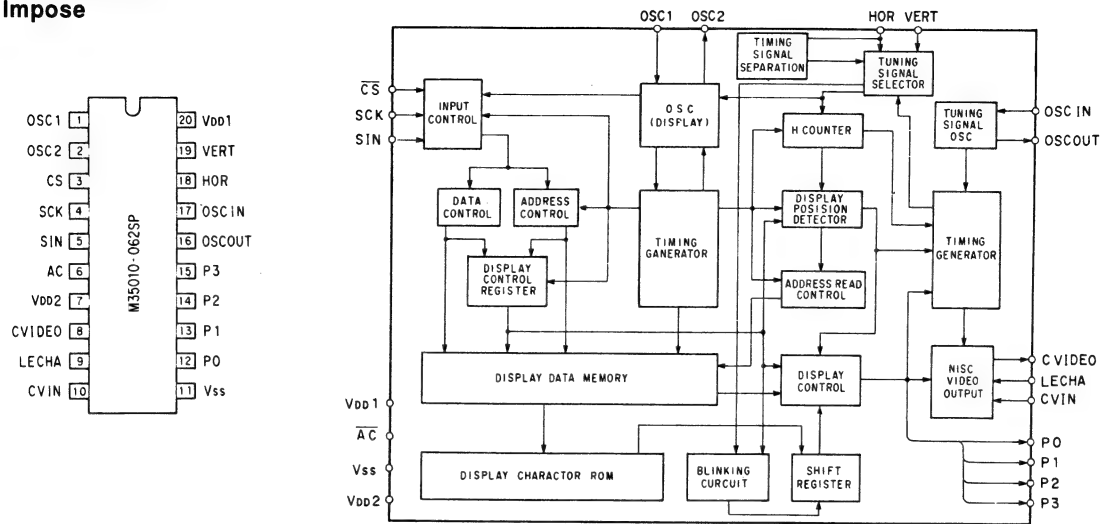
**Note :** Alphabets used in the above I/O column represent as follows.

**I :** Input terminal    **O :** Output terminal    **t :** TTL level

**C :** CMOS level    **S :** Schmidt input    **A :** Analog

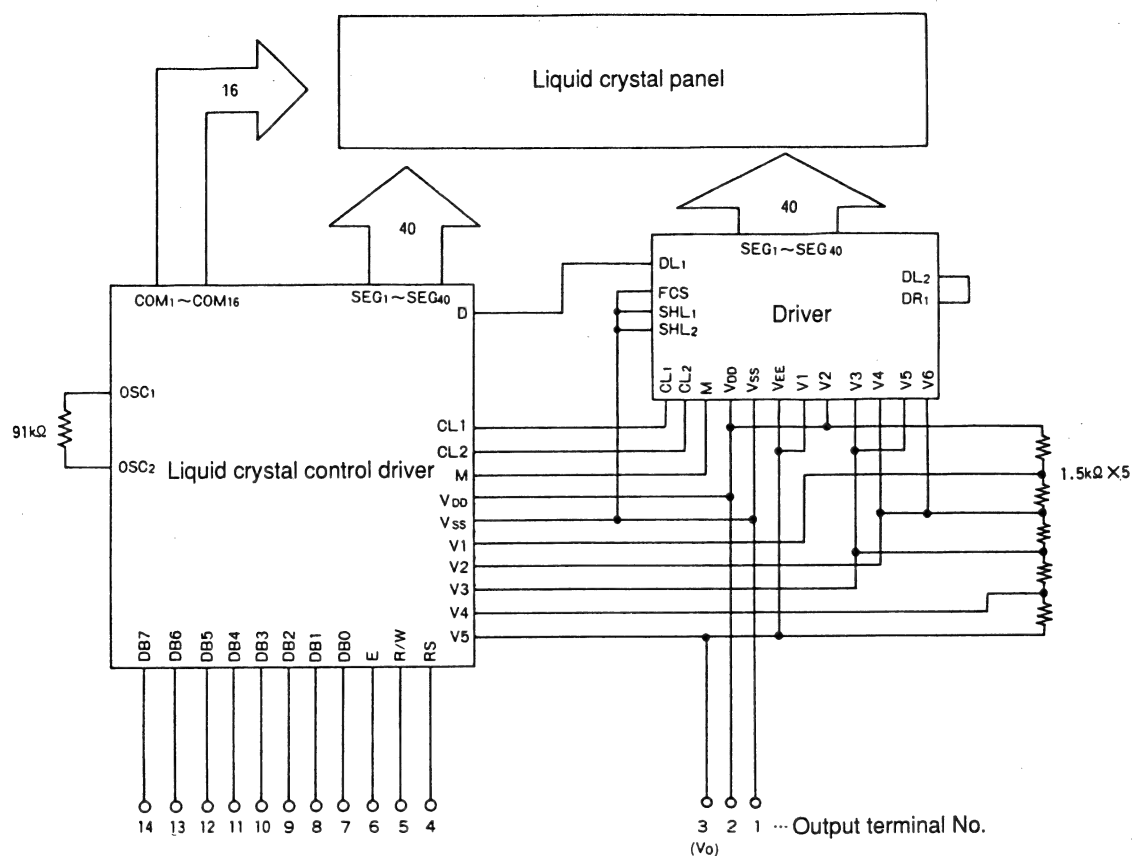
## DSP-A970

### IC9 : M35010-062SP Super Impose



Pin No.	Symbol	Terminal name	Function
1 2	OSC1 OSC2	External terminal for oscillation circuit	External terminal of oscillation circuit for display. The standard oscillation frequency is about 7MHz. The display position in the horizontal direction and width of characters on the TV screen are determined according to this oscillation frequency.
3	CS	Chip select input	Chip select terminal "L" is set when the serial data is transferred. Hysteresis input. A pull-up resistor is built in.
4	SCK	Serial clock input	When CS terminal is "L", the SIN serial data is taken in at the SCK rise. Hysteresis input. A pull-up resistor is built in.
5	SIN	Serial data input	The data and addresses for the display control register and display data memory are inputted in the serial form. Hysteresis input. A pull-up resistor is built in.
6	AC	Auto clear input	The IC internal circuit is reset when in "L" state. Hysteresis input. A pull-up resistor is built in.
7	VDD2	Power supply terminal	Analog type power supply terminal that should be connected to +5V.
8	CVIDEO	Composite video signal output	Output terminal for composite video signal 2Vp-p composite video signal is output. When making a superimposition, the character output and other features are superimposed on the composite video signals inputted through the CVIN terminal.
9	LECHA	Character level input	Input terminal to determine the output level for the characters in the composite video signals. The color of characters is white.
10	CVIN	Video input	Input terminal for external composite video signals. When making a superimposition, the character output and other features are superimposed on these composite video signals.
11	VSS	Ground terminal	Connection to GND is made by using this terminal.
12	P0	Port 0 output	Port terminal output or character background signals (BLNK1) are output. The polarity can be selected when determining the font ROM.
13	P1	Port 1 output	Port terminal output or character background signals (CO1) are output. The polarity can be selected when determining the font ROM.
14	P2	Port 2 output	Port terminal output or character background signals (BLNK2) are output. The polarity can be selected when determining the font ROM.
15	P3	Port 3 output	Port terminal output or character background signals (CO2) are output. The polarity can be selected when determining the font ROM.
16 17	OSCOUT OSCIN	Oscillation circuit for generation of synchronous signals	External terminal of the oscillation circuit for generation of synchronous signals. The oscillation frequency is 14.32MHz when the NTSC system is used and 17.73MHz when the PAL system is used.
18	HOR	Horizontal synchronous signal input	Horizontal synchronous signals are inputted. Hysteresis input The polarity can be selected when determining the font ROM.
19	VERT	Vertical synchronous signal input	Vertical synchronous signals are inputted. Hysteresis input The polarity can be selected when determining the font ROM.
20	VDD1	Power supply terminal	Digital type power supply terminal that should be connected to +5V.

# ■ LCD UNIT DATA (VP332900)



Pin No.	Pin Name	Function
1	VSS	(-) side power supply terminal, 0V
2	VDD	(+) side power supply terminal, +5V
3	VO	LCD drive voltage application terminal
4	RS	Input terminal, HI = Data, LOW = Instruction
5	R/W	Input terminal, HI = Read, LOW = Write
6	E	Input terminal, enable signal
7	DB0	Data bus line
8	DB1	
9	DB2	
10	DB3	
11	DB4	
12	DB5	
13	DB6	
14	DB7	

\* The IC's used for the LCD unit are as follows.

IX607280(LC7930)

IX607290 (HD44780A00)

Any part other than IC can't be replaced individually. If replacement becomes necessary, be sure to replace as a whole unit.

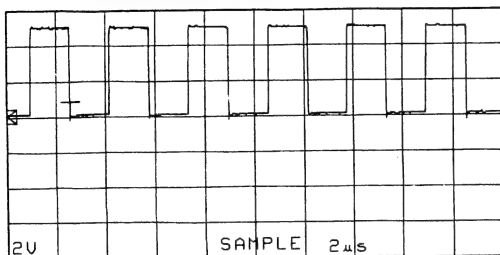
# ■ TEST POINT WAVEFORMS

## Point ① (Pin18 of IC610)

V : 2V/div H : 2μsec/div

DC range 1 : 1 probe

\* This waveform is produced when the sound field program is changed.

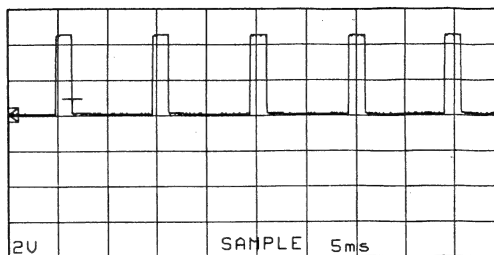


## Point ⑤ (Pin50 of IC624)

V : 2V/div H : 5msec/div

DC range 1 : 1 probe

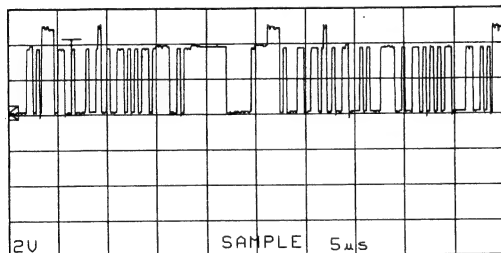
\* This waveform is produced when the function is changed.



## Point ② (Pin19 of IC610)

V : 2V/div H : 5μsec/div

DC range 1 : 1 probe

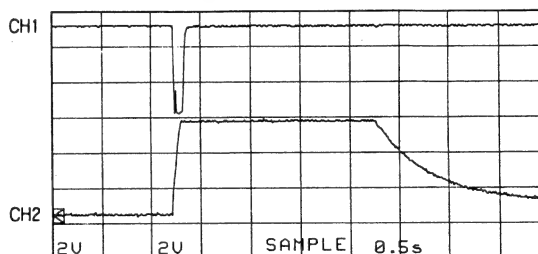


## Point ⑥

(CH1 : Pin8 of IC624  
CH2 : Out terminal of IC623)

V : 2V/div H : 0.5sec/div

DC range 1 : 1 probe



With the POWER switch turned ON, connect the power cord to the AC outlet.

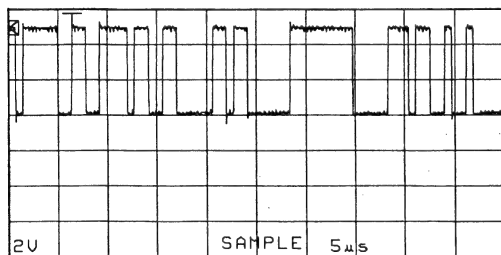
Disconnect the power cord from the AC outlet.

\* This waveform is not available by pushing the power switch ON and OFF.

## Point ③ (Pin24 of IC610)

V : 2V/div H : 5μsec/div

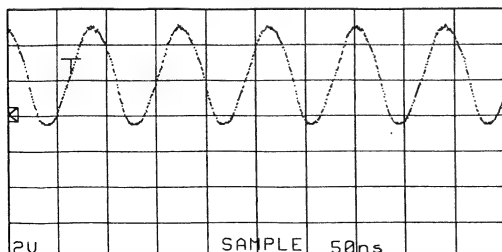
DC range 1 : 1 probe



## Point ④ (Pin52 of IC610)

V : 2V/div H : 50nsec/div

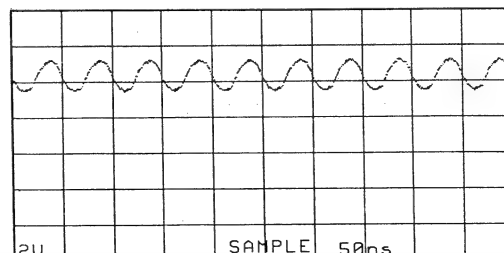
DC range 1 : 1 probe



## Point ⑦ (Pin10 of IC624)

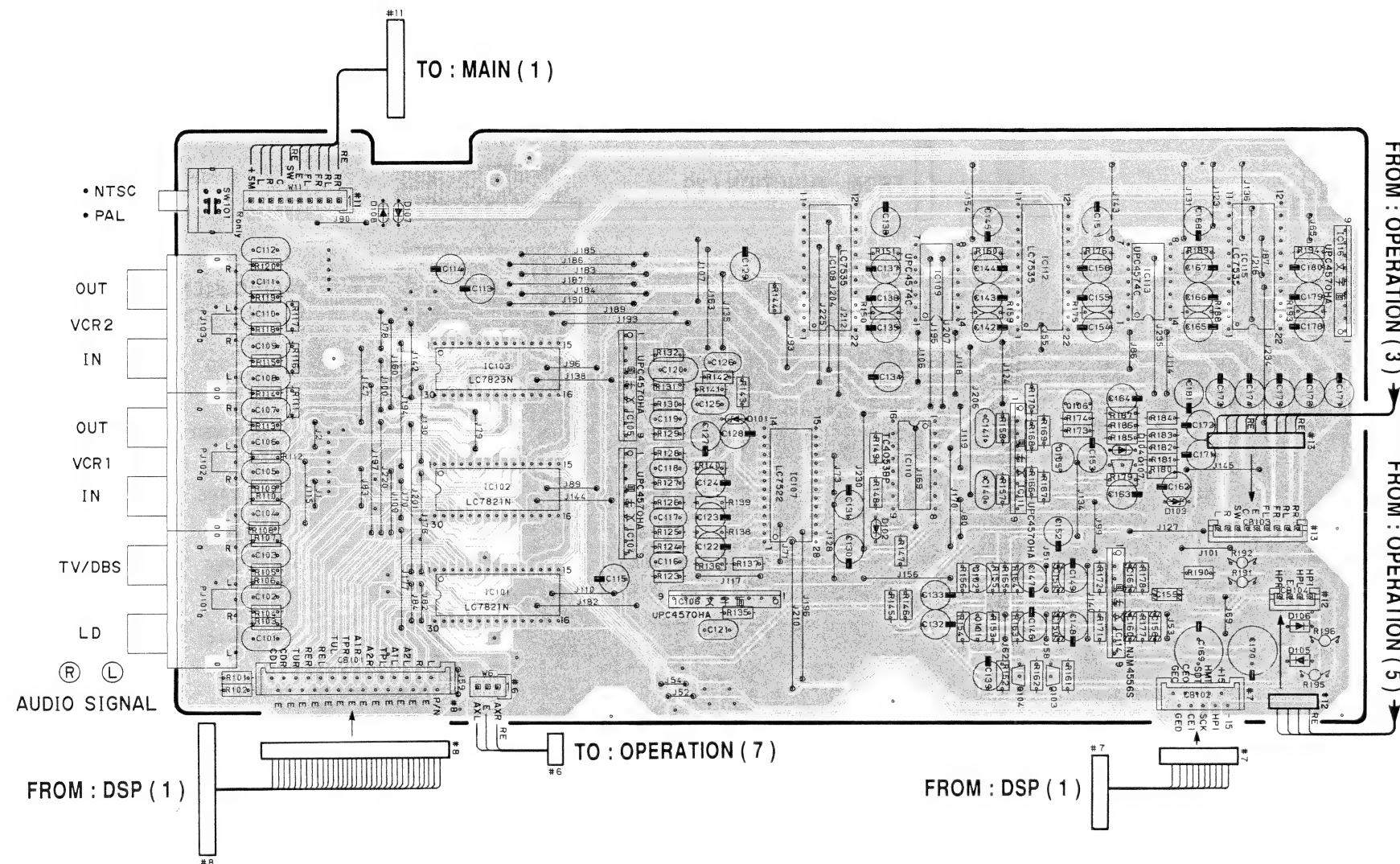
V : 2V/div H : 50nsec/div

DC range 1 : 1 probe

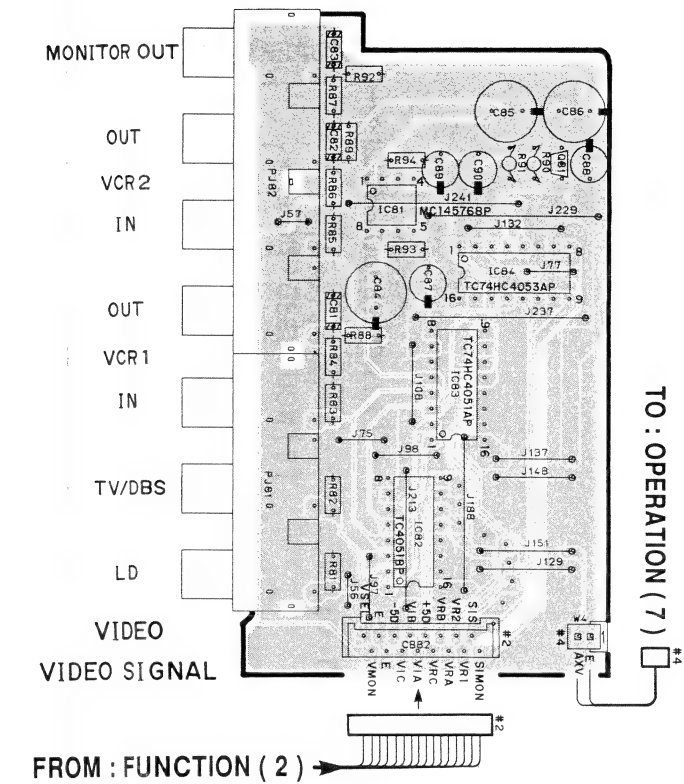


■ **PRINTED CIRCUIT BOARD (Foil side)**

**FUNCTION P. C. B. ( 1 )**



**FUNCTION P. C. B. ( 3 )**

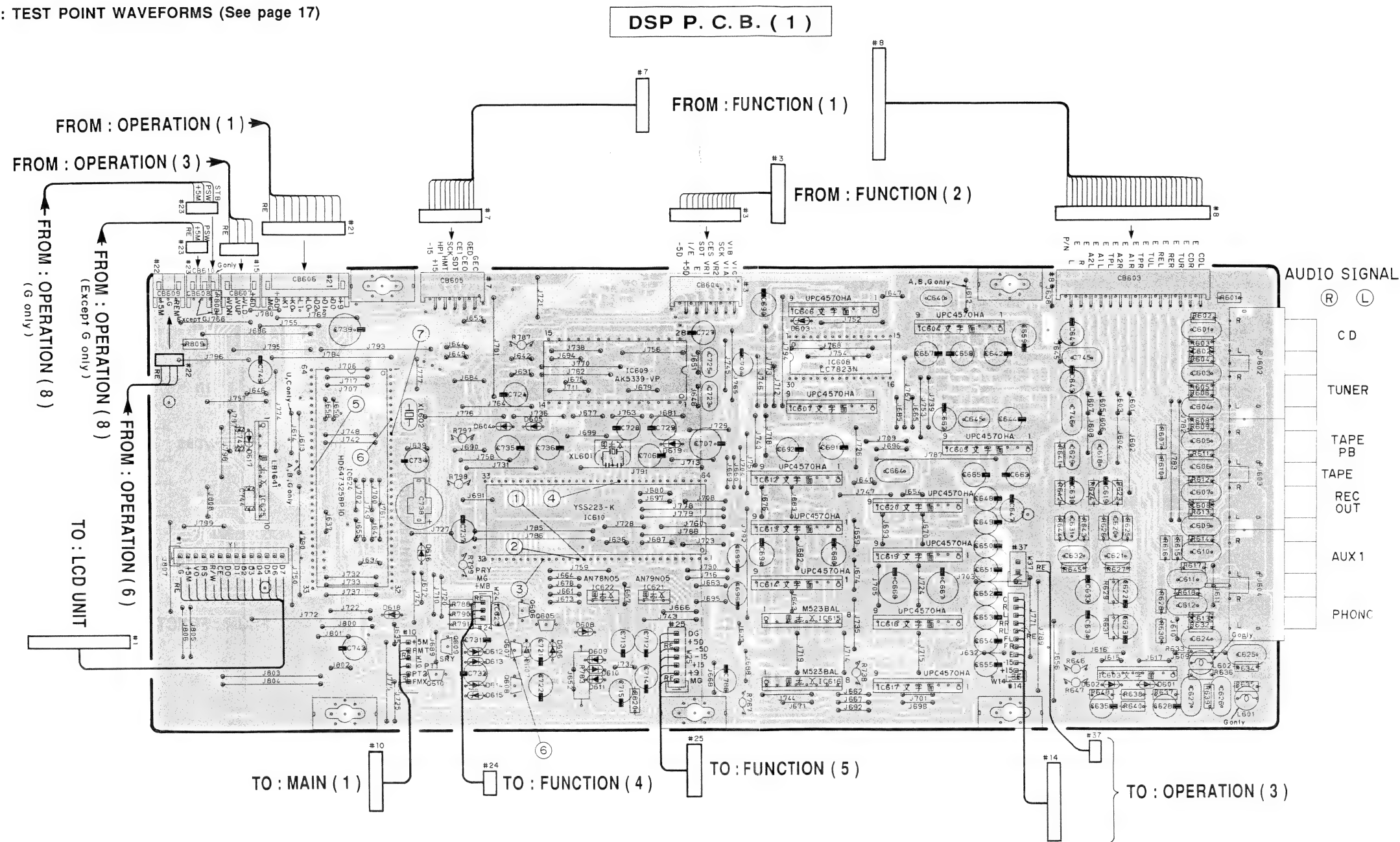


### ● Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
IC101	C3	IC109	D2	Q101	D3
IC102	C3	IC110	D3	Q102	D3
IC103	C3	IC111	D3	Q103	D4
IC104	C3	IC112	D2	Q104	D4
IC105	C3	IC113	E2	Q105	E3
IC106	C3	IC114	E3	Q106	E3
IC107	D3	IC115	E2	Q107	E3
IC108	D2	IC116	F2		

■ PRINTED CIRCUIT BOARD (Foil side)

① to ⑦ : TEST POINT WAVEFORMS (See page 17)



● Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
IC603	F4	IC615	E4	Q605	D4
IC604	F2	IC616	E4	Q606	D4
IC605	F3	IC617	E4	Q607	D4
IC606	E2	IC618	E4	Q608	D4
IC607	E3	IC619	E3	Q609	C4
IC608	E3	IC620	E3	Q610	C4
IC609	D3	IC621	D4		
IC610	D3	IC622	D4		
IC612	E3	IC623	D4		
IC613	E3	IC624	C3		
IC614	E4	IC625	C3		



A

B

C

D

E

F

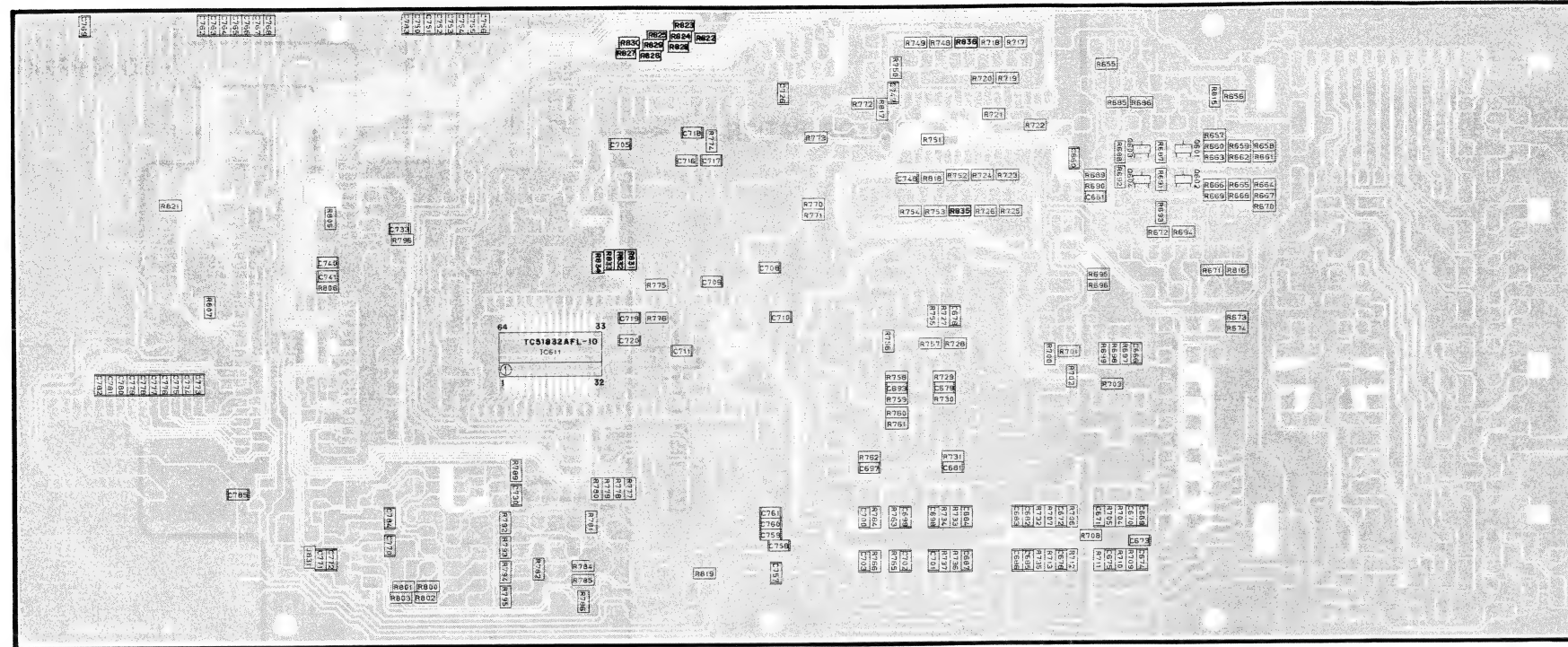
G

H

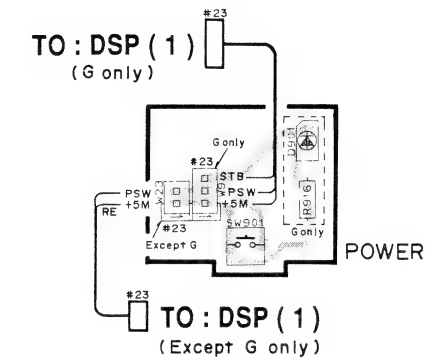
DSP-A970

# **PRINTED CIRCUIT BOARD (Foil side)**

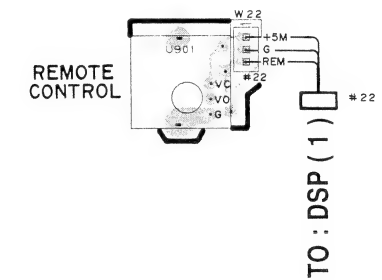
DSP P. C. B. ( 1 )



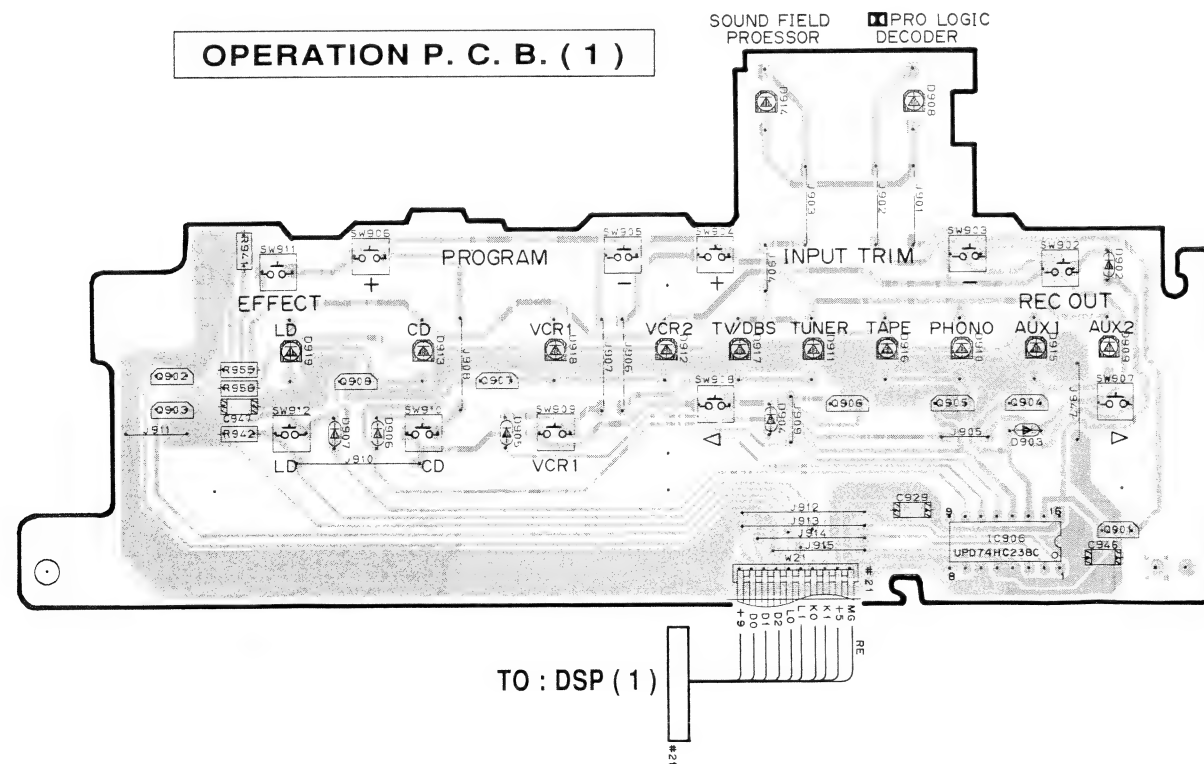
OPERATION P. C. B. ( 8 )



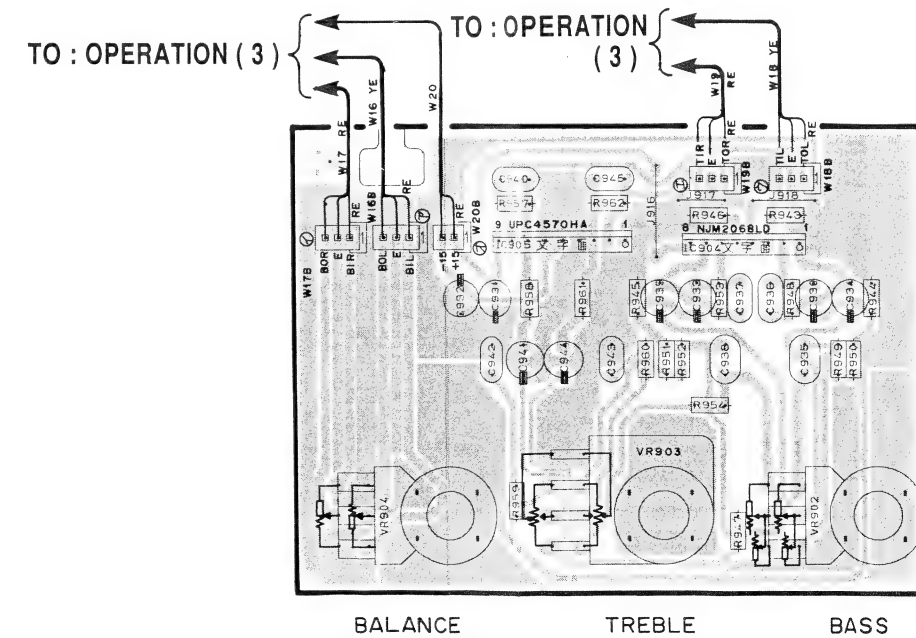
OPERATION P. C. B. ( 6 )



OPERATION P. C. B. ( 1 )

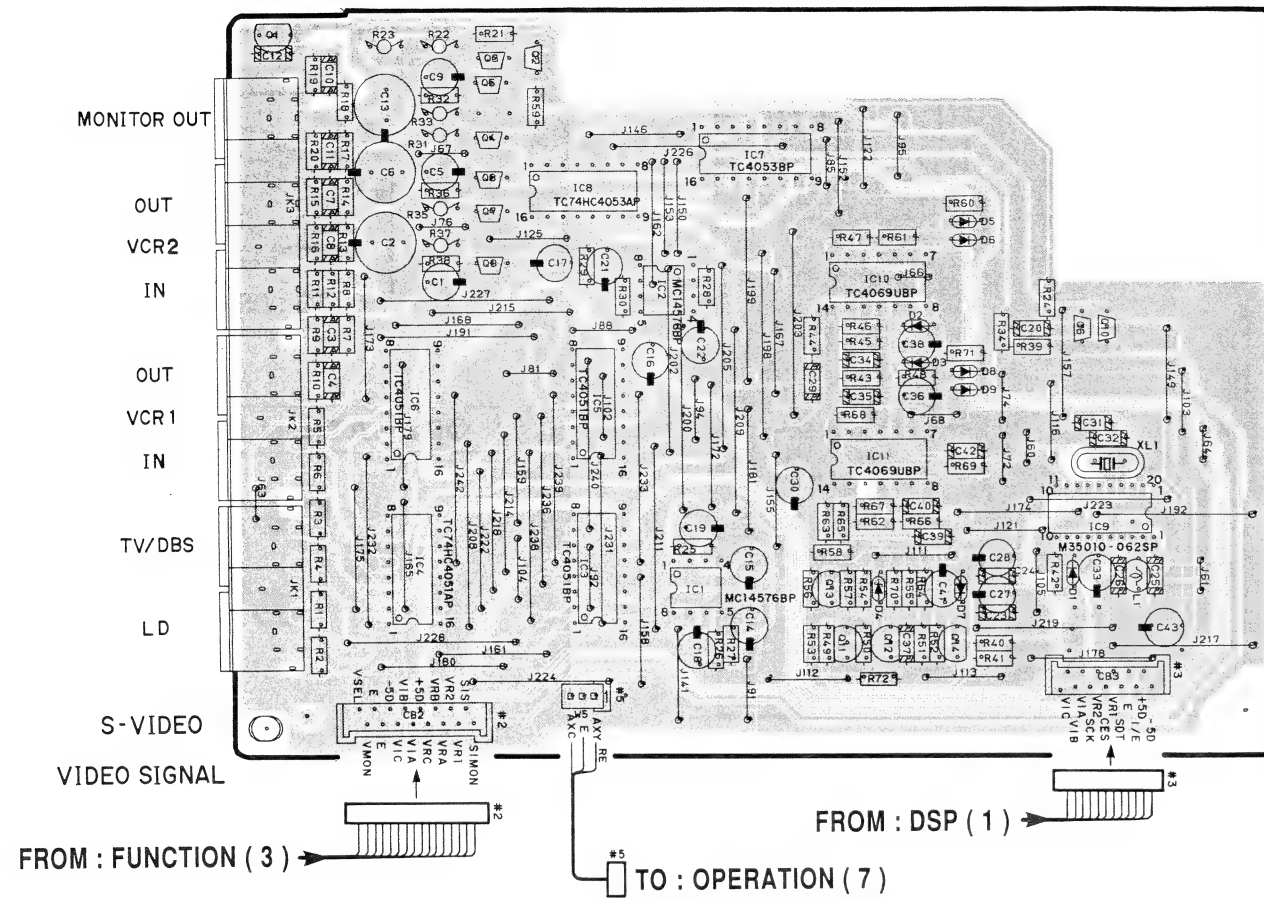


OPERATION P. C. B. ( 4 )

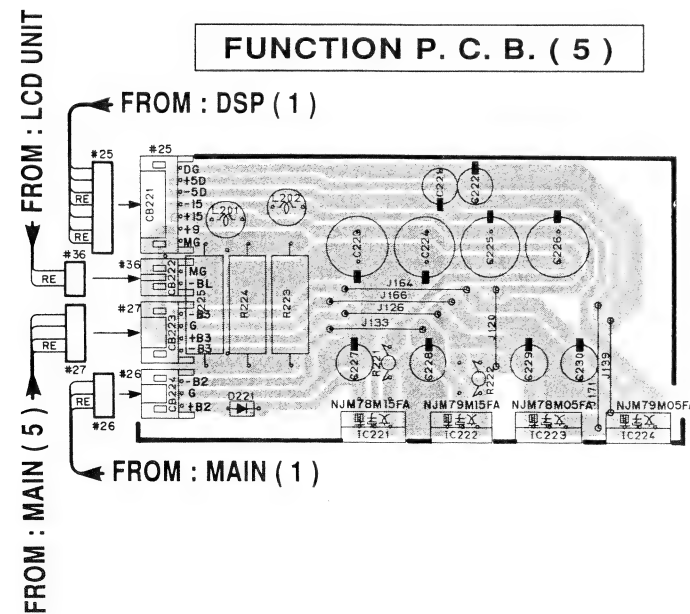


■ PRINTED CIRCUIT BOARD (Foil side)

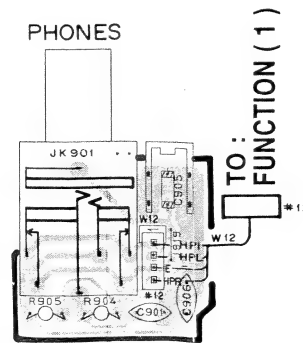
FUNCTION P. C. B. ( 2 )



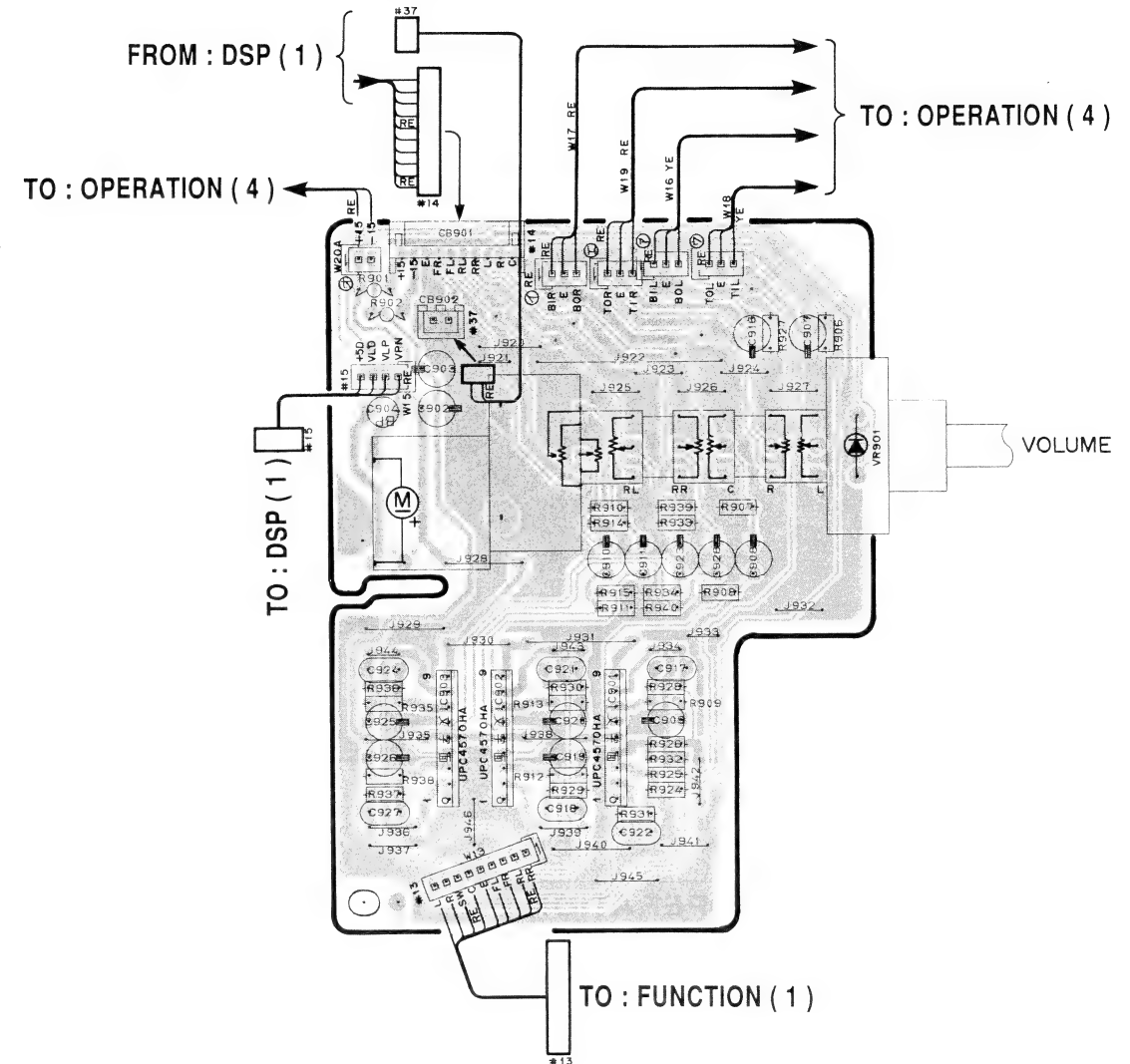
FUNCTION P. C. B. ( 5 )



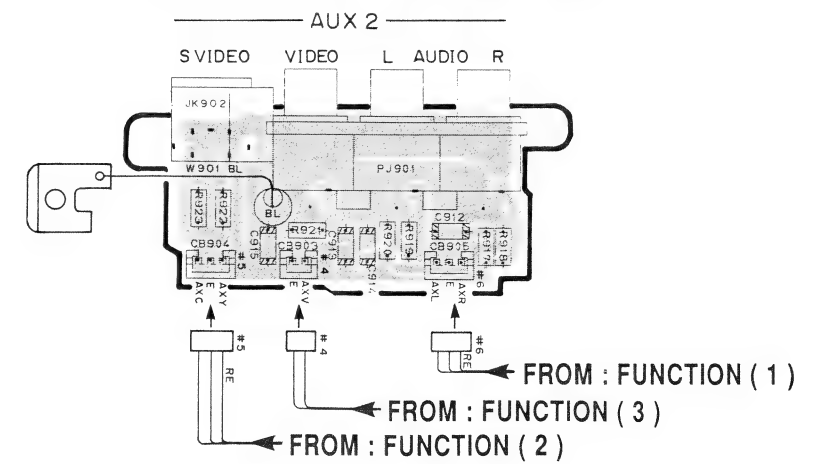
OPERATION P. C. B. ( 5 )



OPERATION P. C. B. ( 3 )



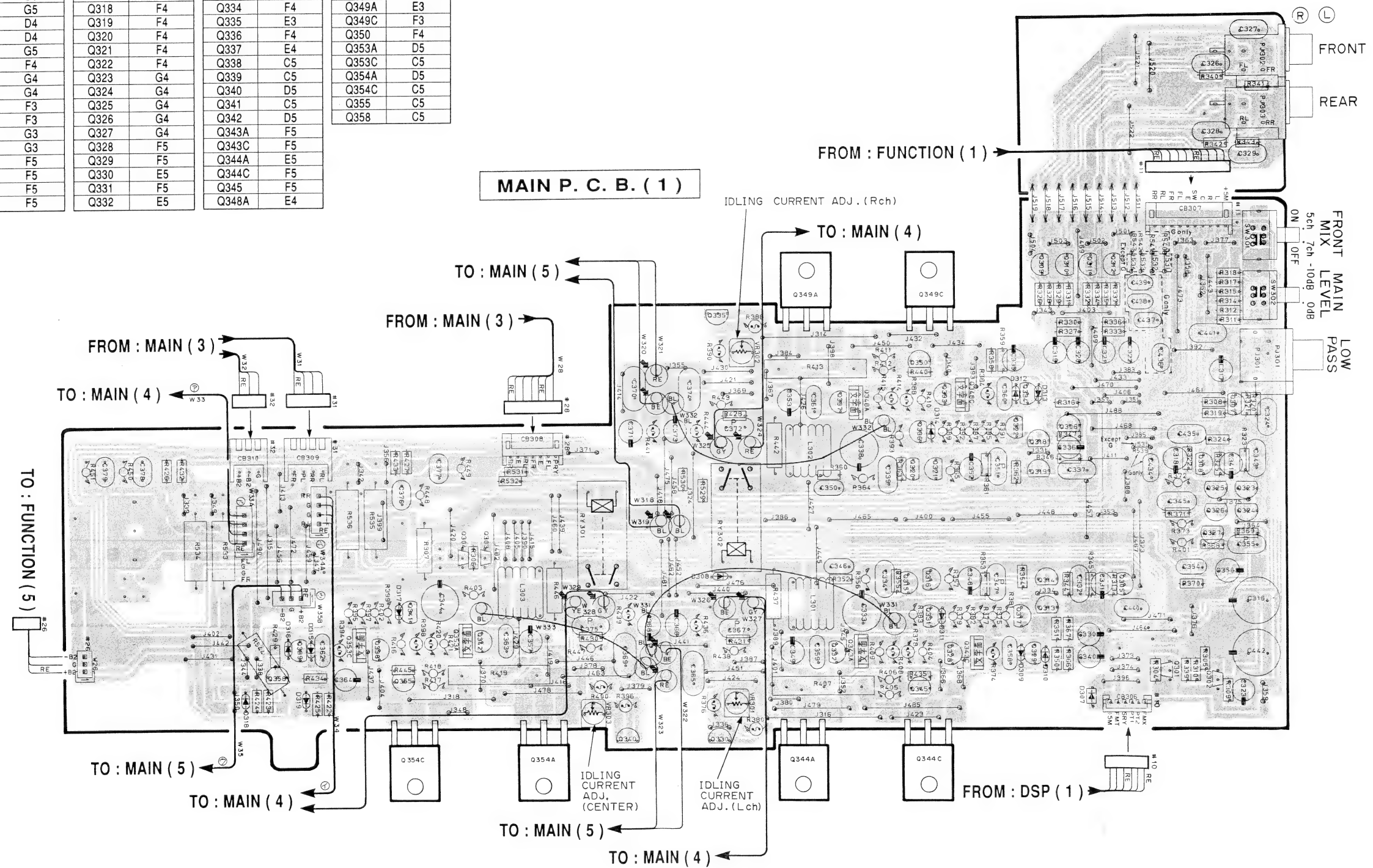
OPERATION P. C. B. ( 7 )



## ■ PRINTED CIRCUIT BOARD (Foil side)

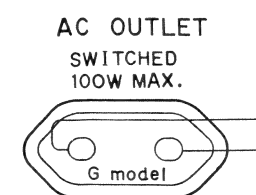
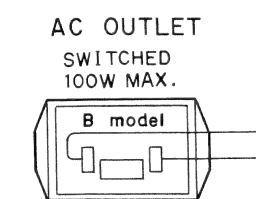
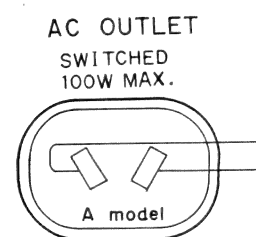
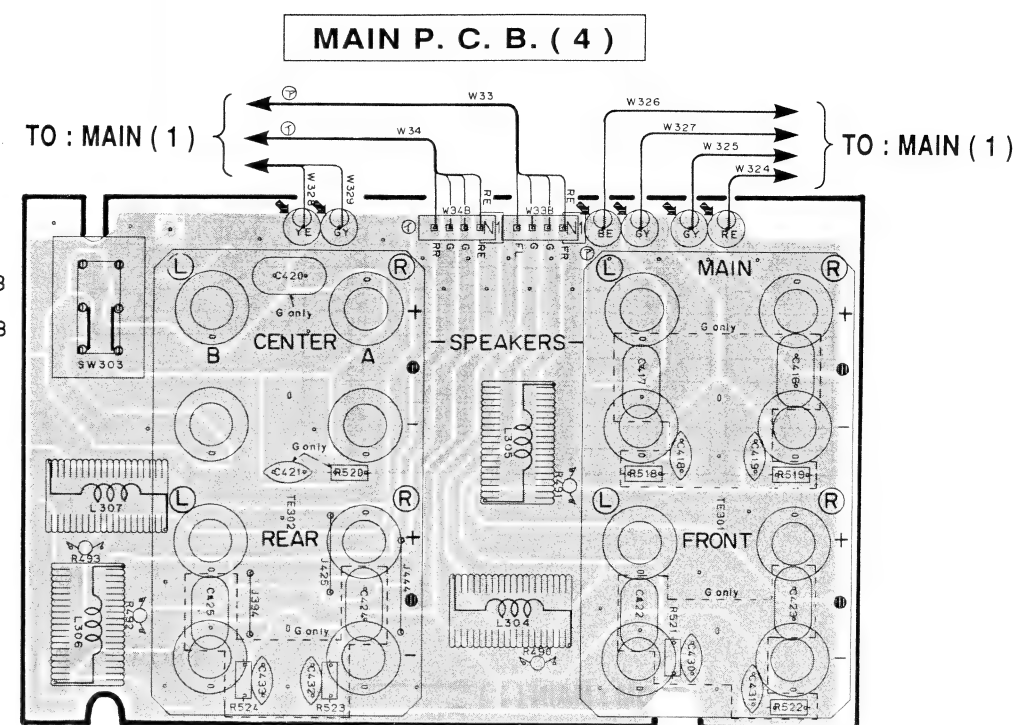
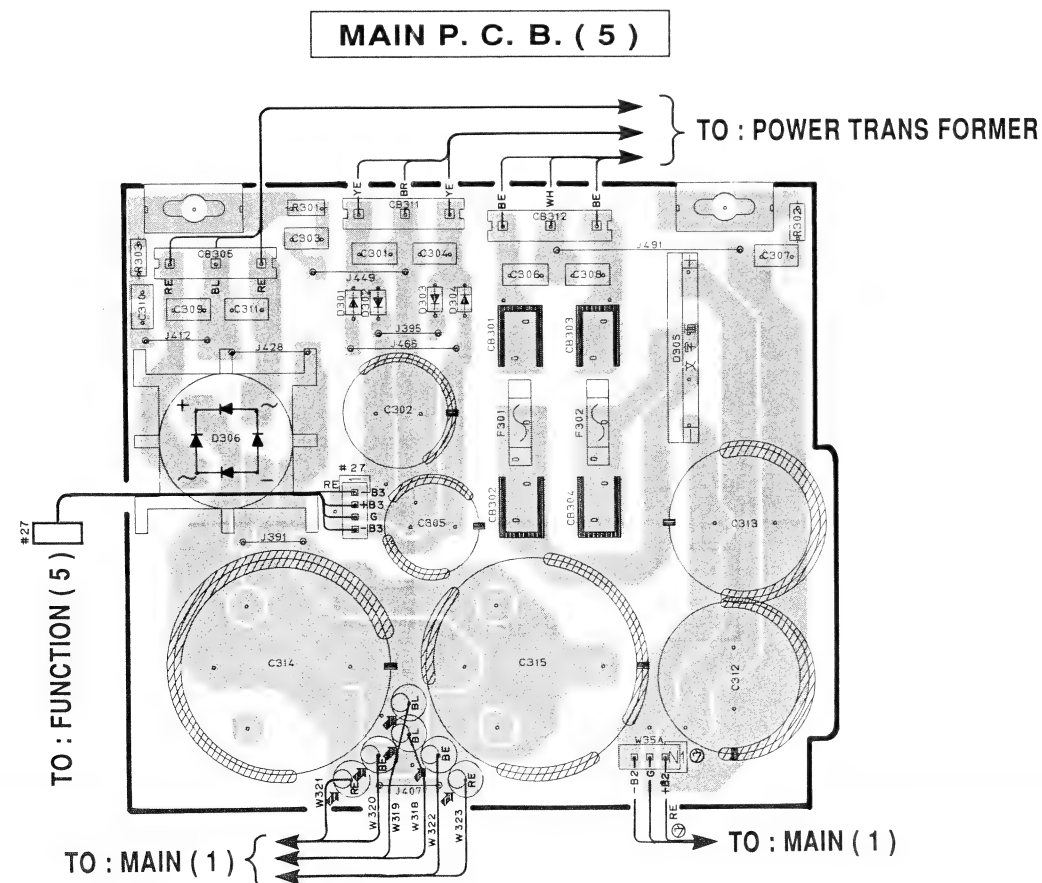
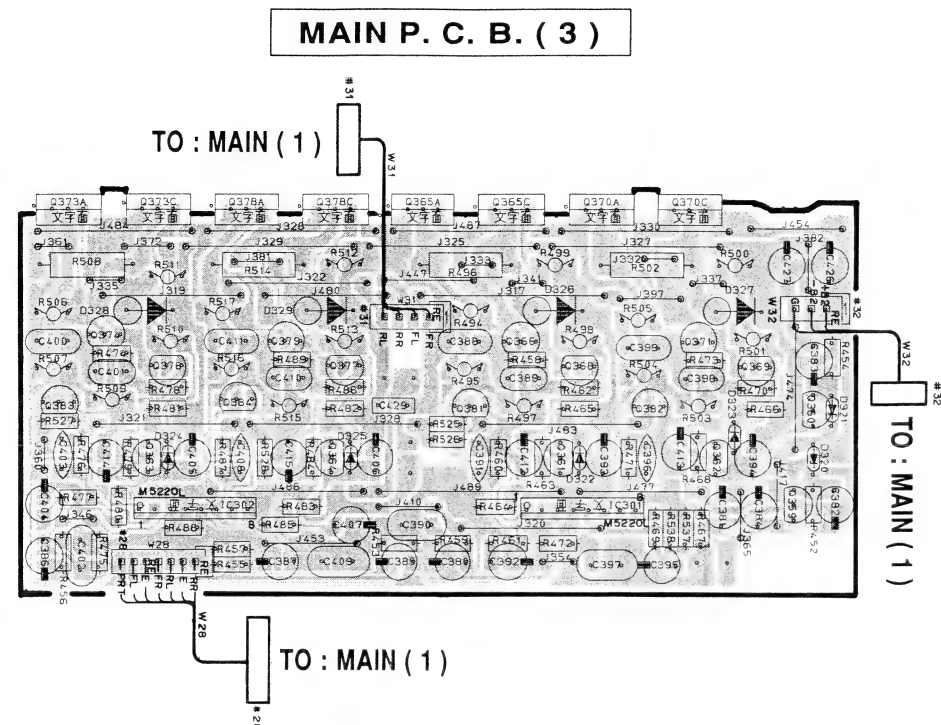
## ● Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
Q301	G5	Q317	F5	Q333	F4	Q348C	F4
Q302	G5	Q318	F4	Q334	F4	Q349A	E3
Q303	D4	Q319	F4	Q335	E3	Q349C	F3
Q304	D4	Q320	F4	Q336	F4	Q350	F4
Q305	G5	Q321	F4	Q337	E4	Q353A	D5
Q306	F4	Q322	F4	Q338	C5	Q353C	C5
Q307	G4	Q323	G4	Q339	C5	Q354A	D5
Q308	G4	Q324	G4	Q340	D5	Q354C	C5
Q309	F3	Q325	G4	Q341	C5	Q355	C5
Q310	F3	Q326	G4	Q342	D5	Q358	C5
Q311	G3	Q327	G4	Q343A	F5		
Q312	G3	Q328	F5	Q343C	F5		
Q313	F5	Q329	F5	Q344A	E5		
Q314	F5	Q330	E5	Q344C	F5		
Q315	F5	Q331	F5	Q345	F5		
Q316	F5	Q332	E5	Q348A	E4		

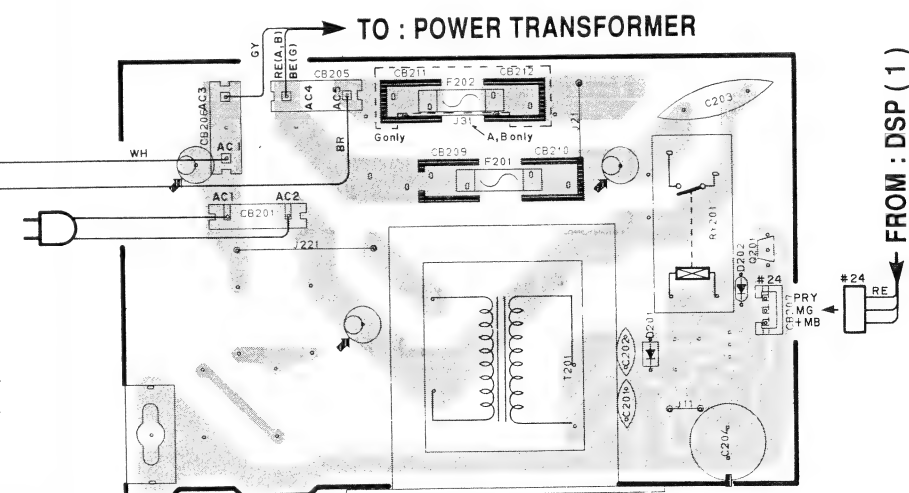




■ PRINTED CIRCUIT BOARD (Foil side)



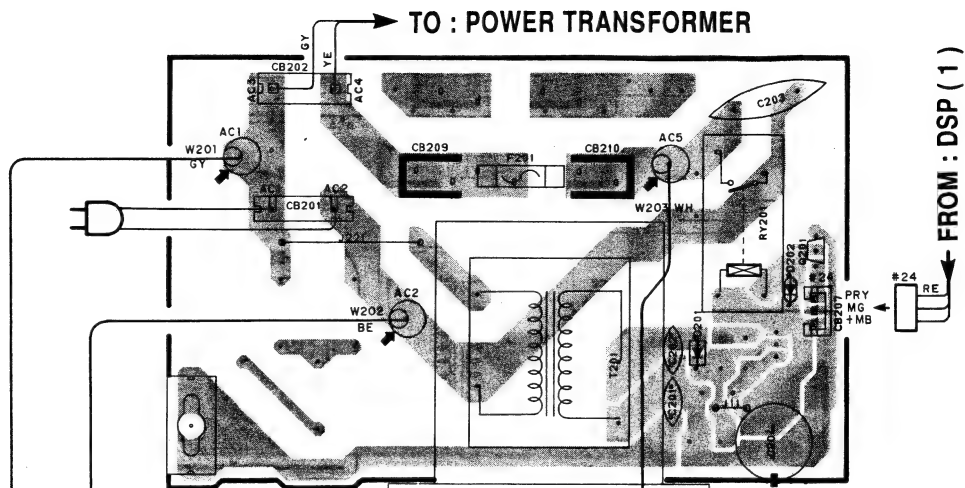
● A, B, G models  
**FUNCTION P. C. B. ( 4 )**



# **PRINTED CIRCUIT BOARD (Foil side)**

● U, C models

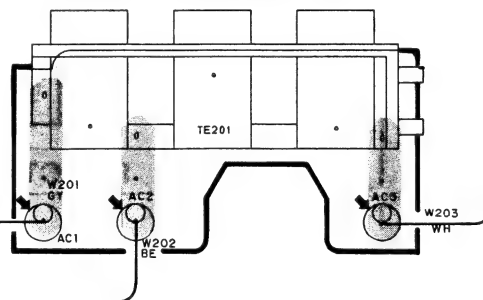
## **FUNCTION P. C. B. ( 4 )**



## **FUNCTION P. C. B. ( 6 )**

### **AC OUTLETS**

UNSWITCHED	SWITCHED
120V 60Hz	120V 60Hz
180W MAX.	120W MAX. TOTAL
1.5A MAX.	1.0A MAX. TOTAL



A

B

C

D

E

DSP-A970

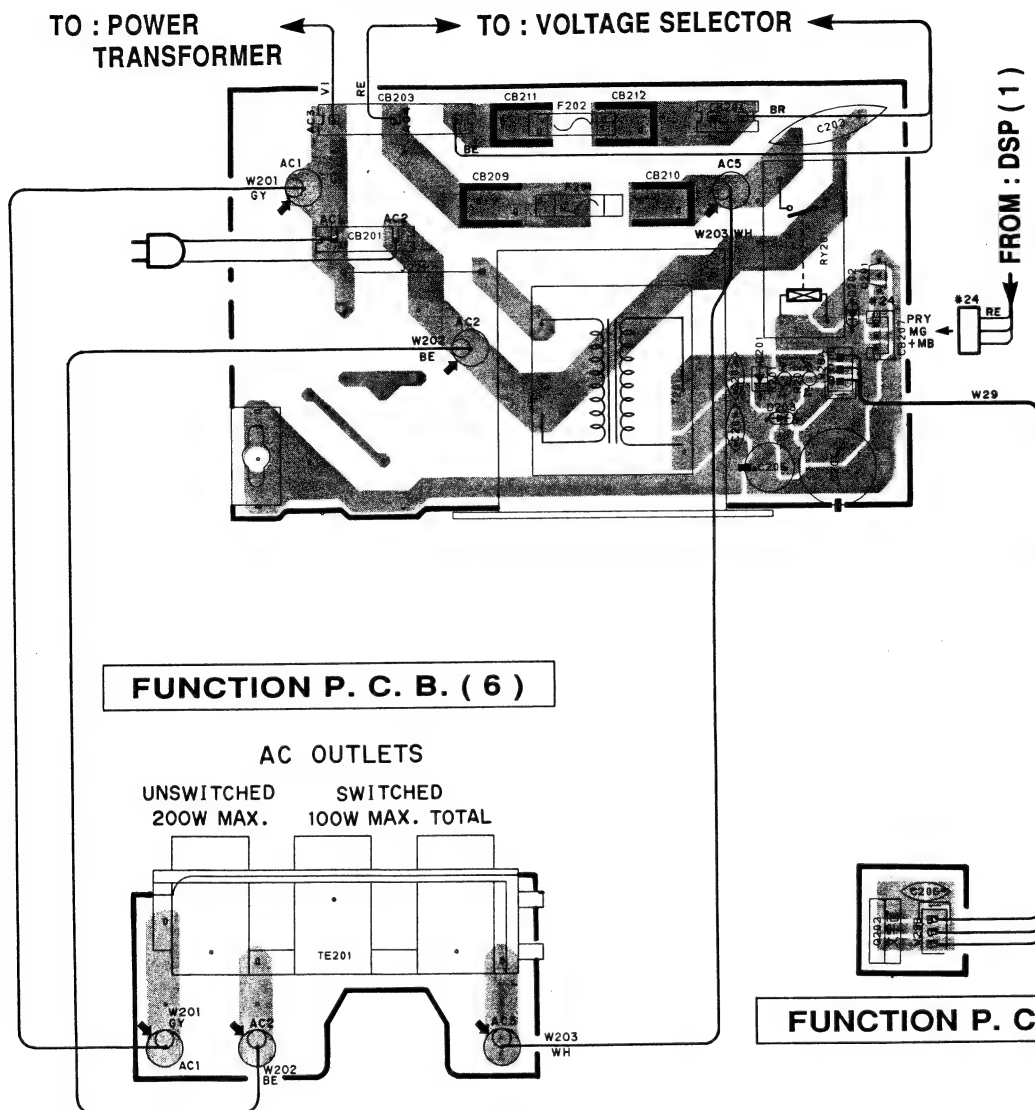
# **PRINTED CIRCUIT BOARD (Foil side)**

● R model

## **FUNCTION P. C. B. ( 4 )**

TO : POWER  
TRANSFORMER

TO : VOLTAGE SELECTOR



## **FUNCTION P. C. B. ( 6 )**

AC OUTLETS

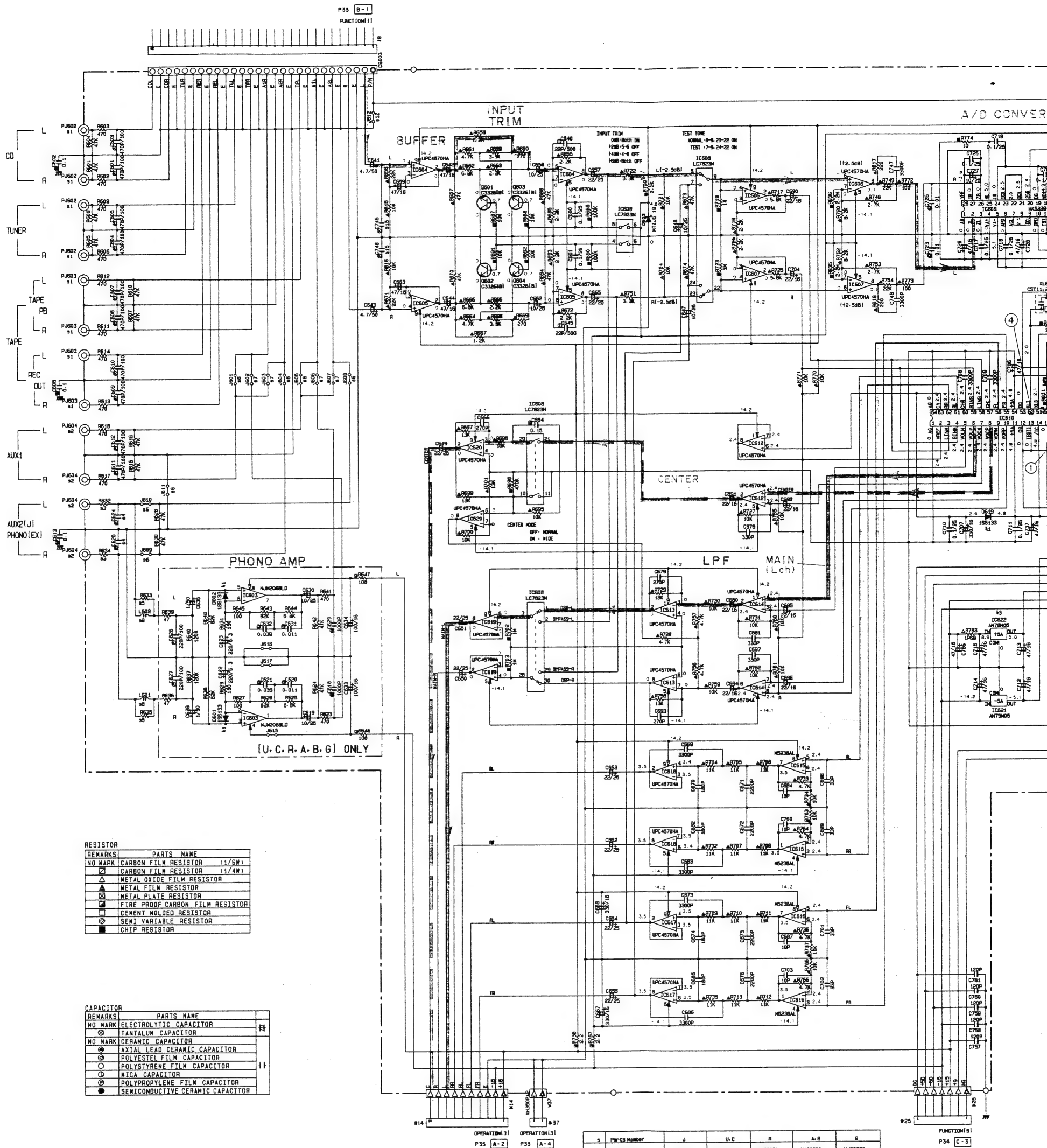
UNSWITCHED  
200W MAX.

SWITCHED  
100W MAX. TOTAL

## **FUNCTION P. C. B. ( 7 )**

# ■ SCHEMATIC DIAGRAM (DSP)

① to ⑦ : TEST POINT WAVEFORMS (See page 17)



REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/5W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
■	METAL PLATE RESISTOR
●	FIRE PROOF CARBON FILM RESISTOR
○	CEMENT WOLOED RESISTOR
◇	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
○	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
●	AXIAL LEAD CERAMIC CAPACITOR
○	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
○	NICA CAPACITOR
○	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

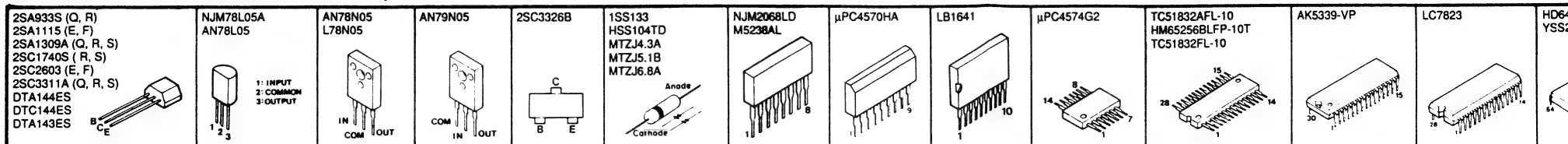
Mark	Reference Parts Number	Parts Name
k1	0601-602-604-614-615-618-619	1SS133 HSS104TD
k2	IC611	HM65256BLFP-10T TC1832FL-10
k3	IC612	AN79N05 L78N05
k4	IC623	NJM78L05A AN78L05
k5	0607-608	2SC1740S1R/S1 2SC26031E/F1 2SC3311A1Q/R/S1
k6	0610	2SA933S1Q/R1 2SA11151E/F1 2SA1305A1Q/R/S1
k7	R783	1P68 H.21468 H.71468

YIND	START	LAST	UNLISTER NO.
R	601	636	549-551-604-610-612
C	601	706	546
B	601	619	
G	601	610	
IC	601	625	
DB	601	610	

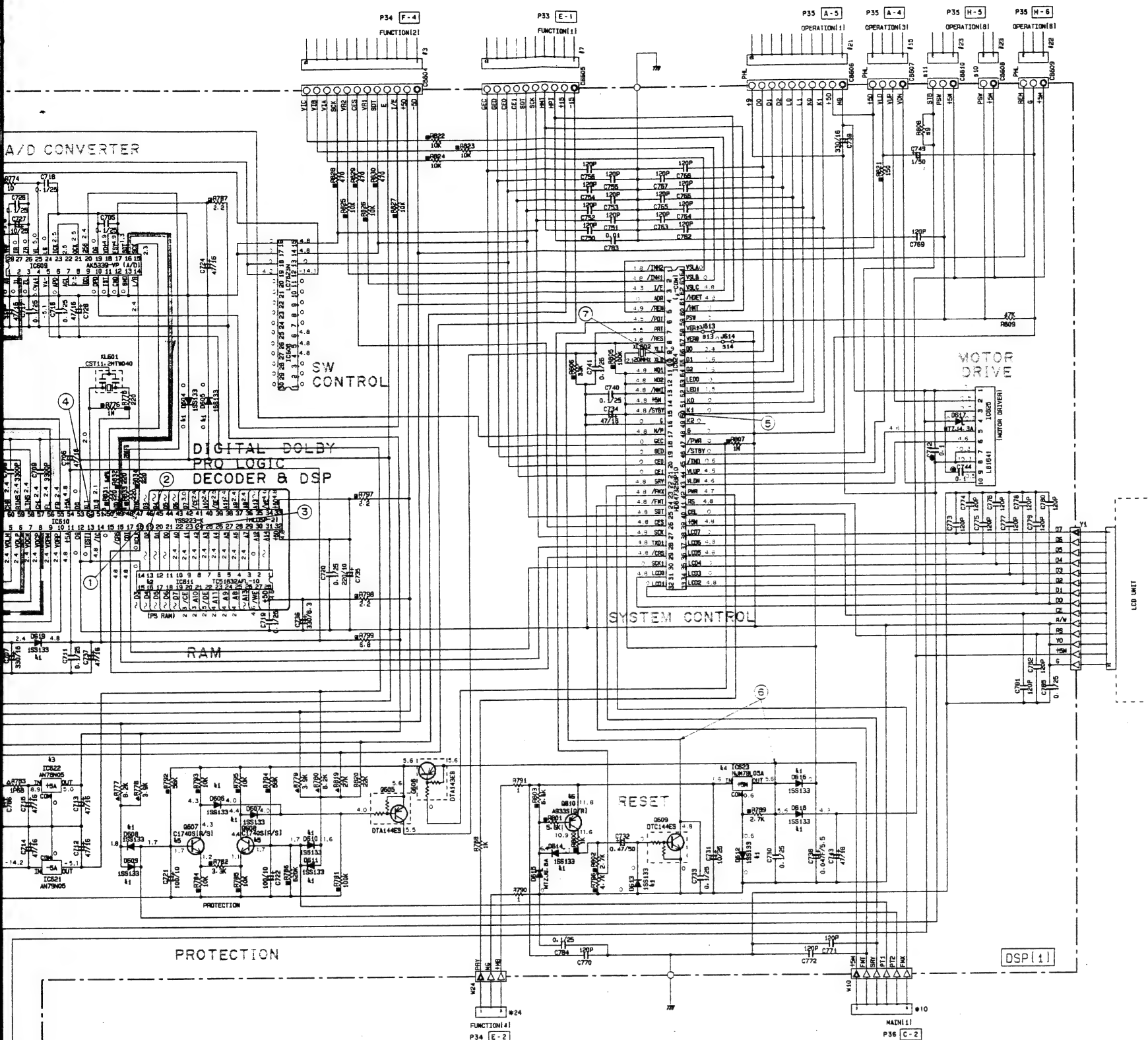
Part Number	J	U.C	R	A.B	S
1 P.602-603	VK17740	VJ69630	VJ69630	VJ69630	VJ69630
2 P.604	VK17740	VK42160	VK42160	VK42160	VK42160
3 H532-634	470	10	10	10	10
4 C624-625	470P/100	100P/100	100P/100	100P/100	100P/100
5 H633-635	×	×	×	×	2.2K
6 501-604-605-608	×	×	×	×	×
7 502-602-606-607	×	×	×	×	×
8 L601-602	×	×	×	×	220uH
9 R608	47K	47K	47K	47K	×
10 C606	V80510	V80510	V80510	V80510	×
11 C616	×	×	×	×	V80510
12 5612	×	×	×	×	×
13 5613	×	×	×	×	×
14 5614	×	×	×	×	×
15 C745-746	100P/100	100P/100	100P/100	100P/100	220P/100
** PNB	3M403	3M404	3M404	3M404	3M404
** PCB	V814290	V814300	V814310	V814320	V814330

NOTE) X : OPEN  
O : USE

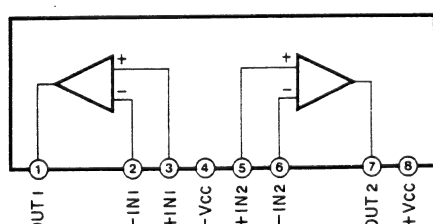
## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.



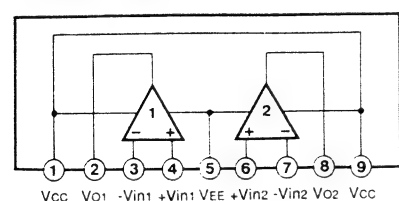




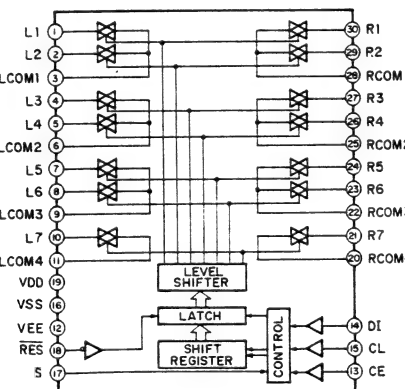
IC603 : NJM2068LD  
IC615, 616 : M5238AL  
Dual OP-Amp



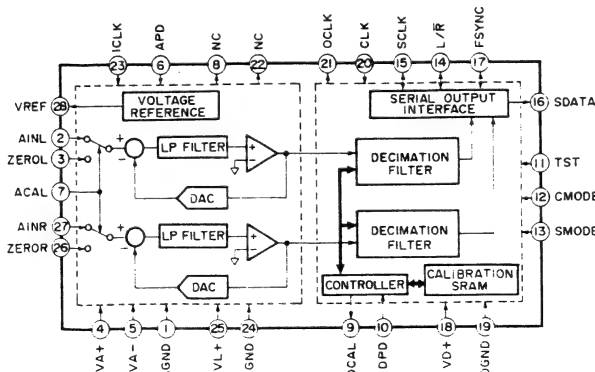
IC604-607, 612-614, 617-620 :  $\mu$ PC4570HA  
Dual OP-Amp



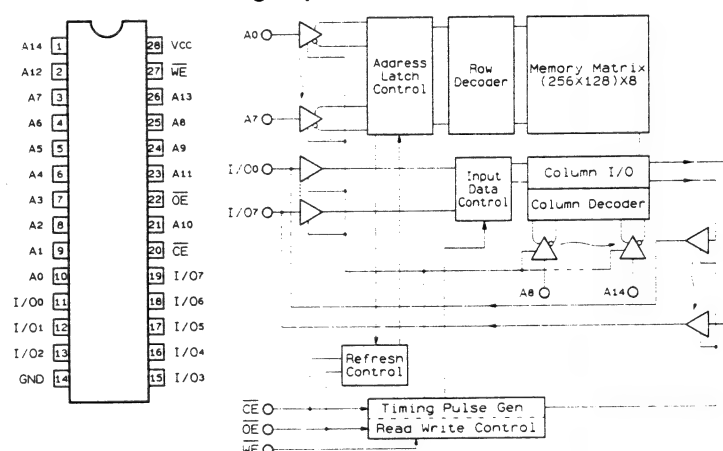
IC608 : LC7823N  
Analog Function Switch



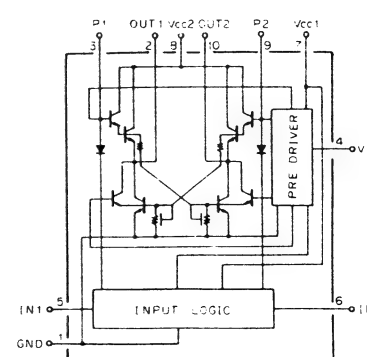
IC609 : AK5339-VP  
16 bit 2-Channel A/D Converter



IC611 : TC51832AFL-10, HM65256BLFP-10T  
or TC51832FL-10  
32768-word x 8 bit High Speed Pseudo Static RAM



IC625 : LB1641  
Motor Driver

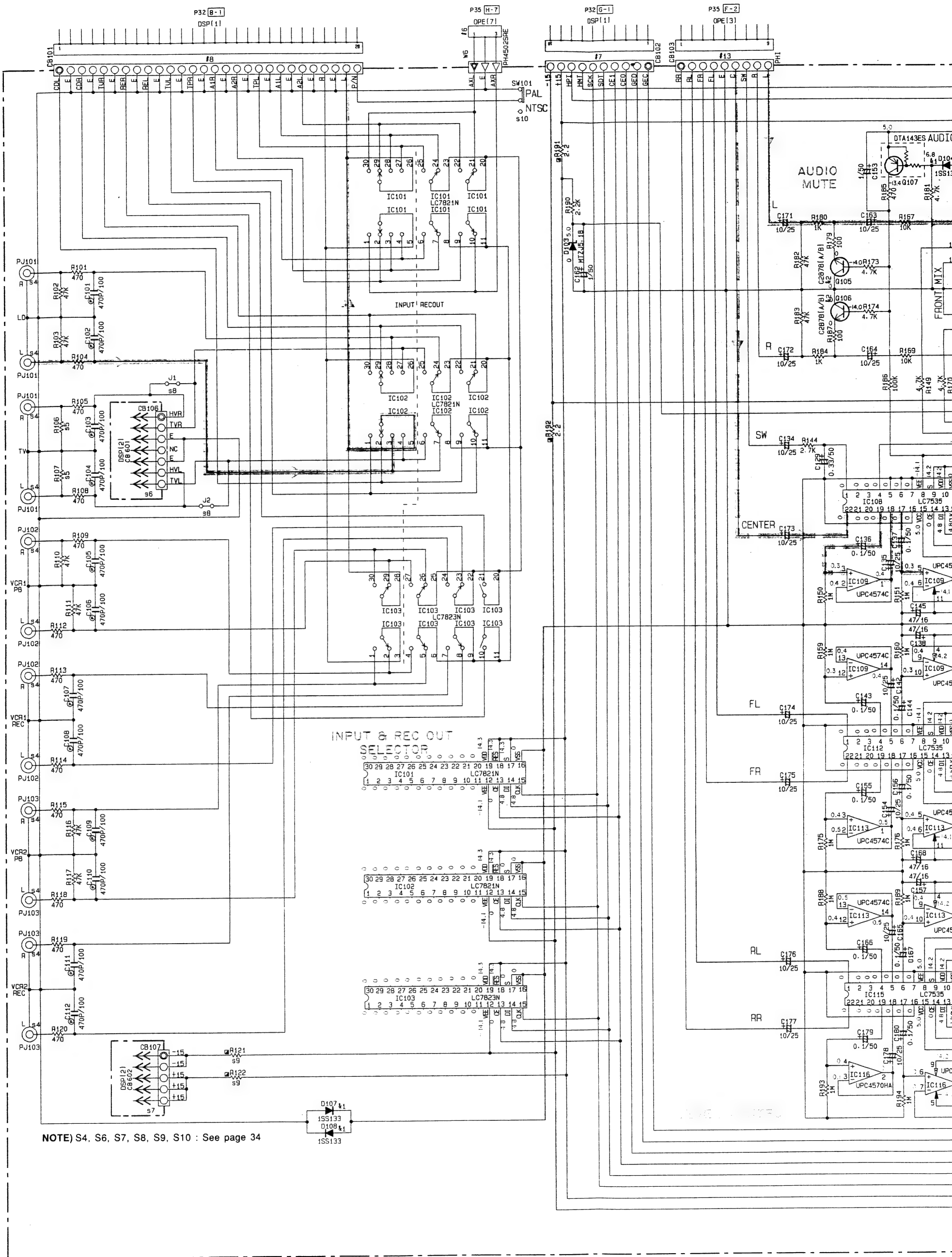


# Conditions

- INPUT → LD
- INPUT TRIM → 0dB
- REC OUT → SOURCE
- PROGRAM → No.1 CONCERT HALL 1 (Hall A in Europe)

- \* All voltage are measured with a 10M $\Omega$ /V DC electric volt meter.
- \* Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.
- \* Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (FUNCTION 1/2)

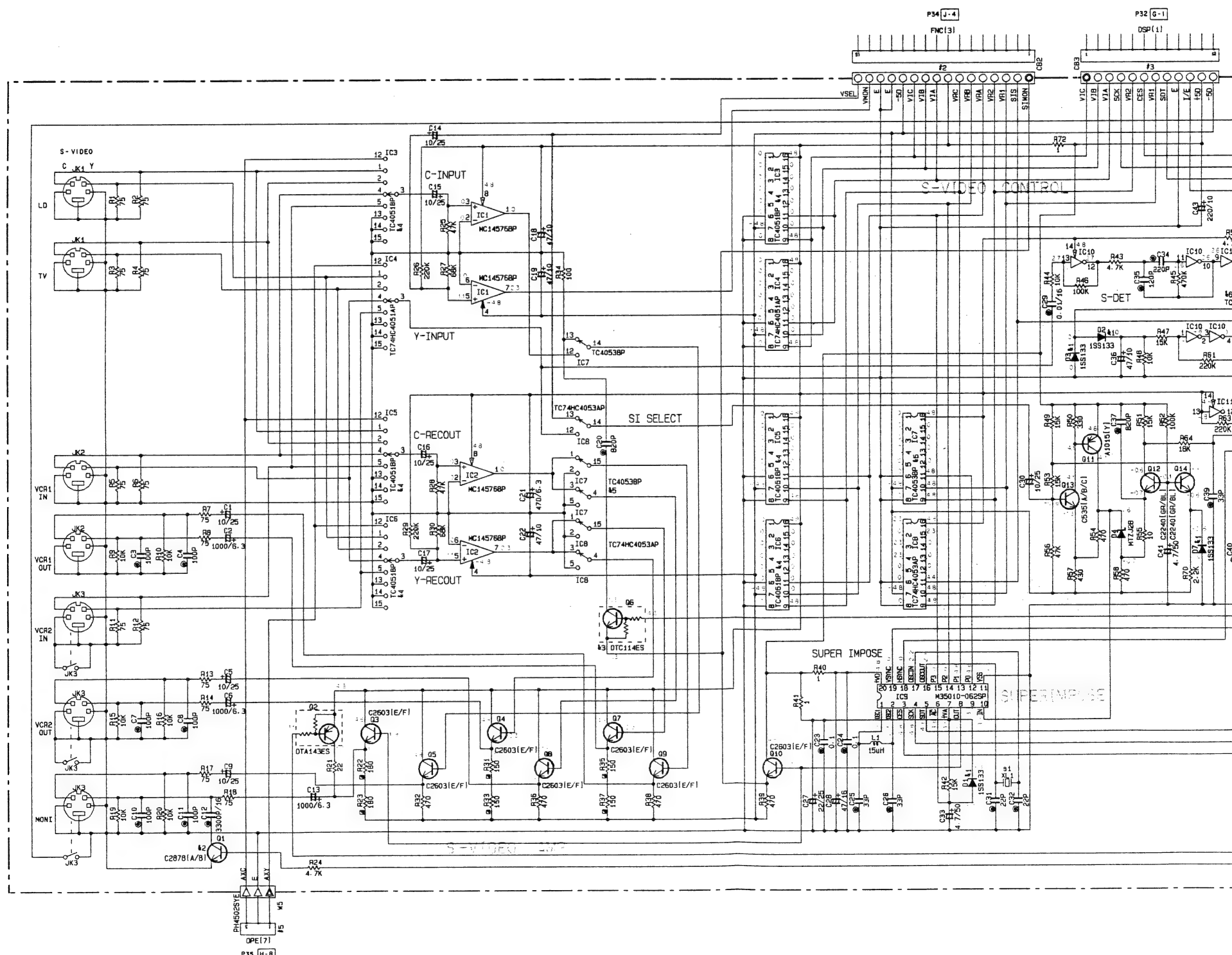
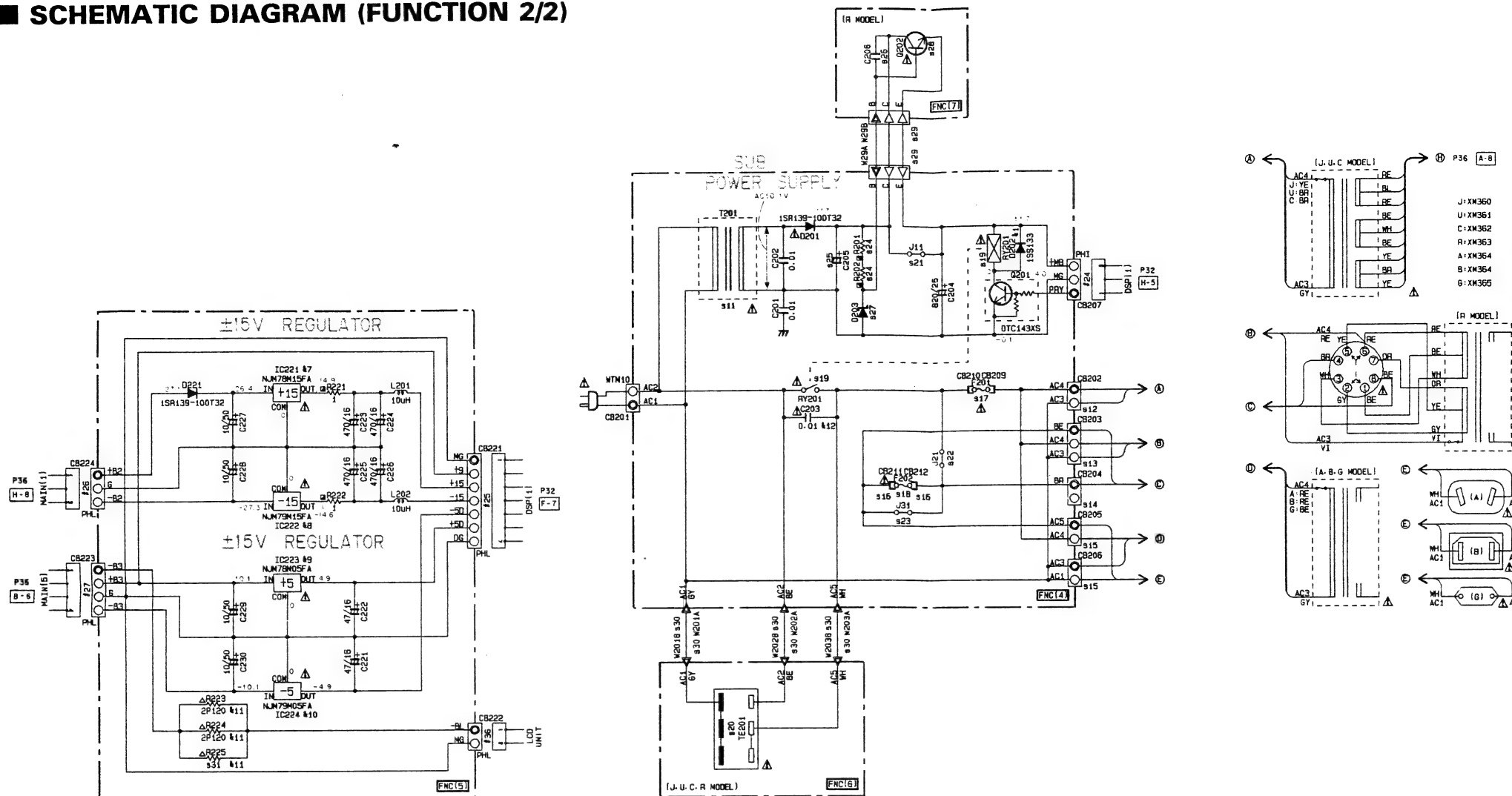


PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

<p>2SC2878 (A, B)</p>	<p>2SC2603 (E, F) DTA143ES 2SD1915 (F) S, T</p>	<p>1SS133 HSS104TD 1SR139-100 MTZJ5.1B MTZJ6.8C</p>	<p>NJM4556S</p>	<p>μPC4570HA</p>	<p>μPC4574C</p>	<p>TC4053BP μPD4053BC</p>	<p>LC7535</p>	<p>LC7522</p>	<p>LC7821N LC7823N</p>
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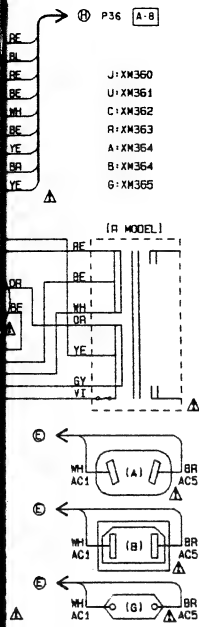
# ■ SCHEMATIC DIAGRAM (FUNCTION 2/2)



## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

<p>2SA1015 (Y) 2SC535 (A, B, C) 2SC2240 (GR, BL) 2SC2878 (A, B)</p>	<p>2SC2603 (E, F) DTA143ES DTC143XS DTC114ES UN4211 2SD1915 (F) S, T</p>	<p>2SC3852</p>	<p>NJM78M15FA AN78M15F NJM78M05FA AN78M05F</p>	<p>NJM79M05FA AN79M05F NJM79M15FA AN79M15F</p>	<p>1SS133 HSS104TD 1SR139-100 MTZJ2.0B MTZJ13.0A</p>	<p>MC14576BP</p>	<p>TC4069UBP μPD4069C</p>	<p>TC4051BP μPD4051BC TC4053BP μPD4053BC TC74HC4051AP TC74HC4053AP</p>	<p>M35010-062SP</p>
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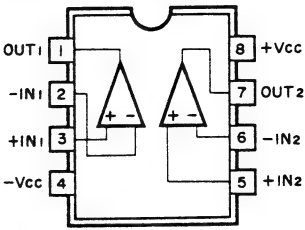
s	RefN	J	U.C	R	A-B	G
1	XL1	14.3MHz	14.3MHz	14.3MHz	17.7MHz	17.7MHz
2	PJB1	VK17720	VJ69590	VJ69590	VJ69590	VJ69590
3	PJB2	VG12010	VW75050	VW75050	VW75050	VW75050
4	PJ101-103	VK17740	VJ69630	VJ69630	VJ69630	VJ69630
5	R106-107	470K	47K	47K	47K	47K
6	CB106	V899480	x	x	x	x
7	CB107	V425230	x	x	x	x
8	J1-2	x	O	O	O	O
9	R121-122	~3150/3.3 *3151~100	x	x	x	x
10	SW101	x	x	VW61970	x	x
11	T201	X1480A0	X1481A0	X1790A0	X1482A0	X1483A0
12	CB202	LA00214	LA00214	x	x	x
13	CB203	x	x	LA00215	x	x
14	CB204	x	x	LA00211	x	x
15	CB205-206	x	x	x	LA00214	LA00214
16	CB211-212	x	x	LB20188	x	LB20188
17	F201	7A 250V	8A 250V	7A 250V	3.15A250V	3.15A250V
18	F202	x	x	3.15A250V	x	2.5A 250V
19	RY201	TV-8	TV-8	TV-8	TV-5	TV-5
20	TE201	VP92400	VP92400	VP92400	x	x
21	J11	O	O	x	O	O
22	J21	x	x	x	O	O
23	J31	x	x	x	O	x
24	R201-202	x	x	5.6K	x	x
25	C205	x	x	47/63	x	x
26	C206	x	x	1000P	x	x
27	D203	x	x	NTZJ13A	x	x
28	Q202	x	x	C3852	x	x
29	W29	O	O	O	x	x
30	W201-203	O	O	O	x	x
31	R225	2P150	2P120	2P150	2P150	2P150
**	PWB	XN394	XN395	XN396	XN397	XN398
**	PCB	VQ14180	VQ14190	VQ14200	VQ14210	VQ14220

NOTE) X : OPEN  
O : USE

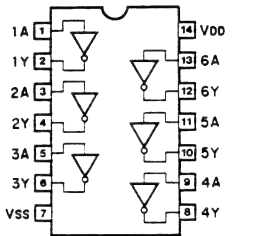
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
A1	D1-3, 5-9, 104, 107, 108, 202	1SS133 HSS104TD
A2	Q1-101, 102, 105, 106	2SC28781A/B1 2SD19151S/T1
A3	Q6	OTC114ES UN4211
A4	IC3, 5, 6, 82	TC4051BP UPD4051BC
A5	IC7, 110	TC4053BP UPD4053BC
A6	IC10, 11	TC4069UBP UPD4069UC
A7	IC221	NJM79M15FA AN79M15F
A8	IC222	NJM79M15FA AN79M15F
A9	IC223	NJM79M05FA AN79M05F
A10	IC224	NJM79M05FA AN79M05F
A11	R223-225	HL221** HL721**
A12	C203	F141410 F151410

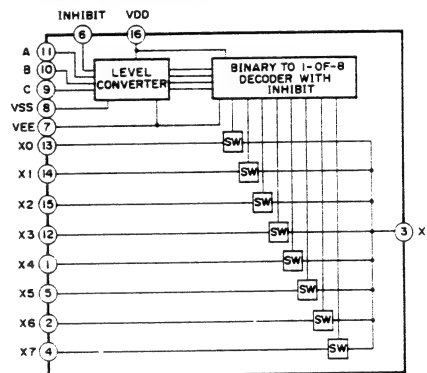
IC1, 2, 81 : MC14576BP  
Dual Video Amp



IC10, 11 : TC4069UBP or  $\mu$ PD4069C  
Hex Inverters

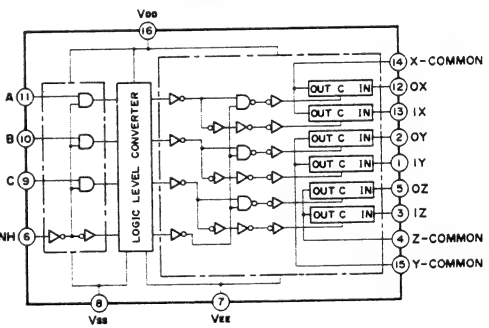


IC3, 5, 6, 82 : TC4051BP or  $\mu$ PD4051BC  
IC4, 83 : TC74HC4051AP  
Single 8-Channel Multiplexer/Demultiplexer



INPUT STATES				"ON" CHANNEL (S)
INHIBIT	C	B	A	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	x	x	x	NONE

IC7 : TC4053BP or  $\mu$ PD4053BC  
IC8, 84 : TC74HC4053AP  
Triple 2-Channel Multiplexer/Demultiplexer

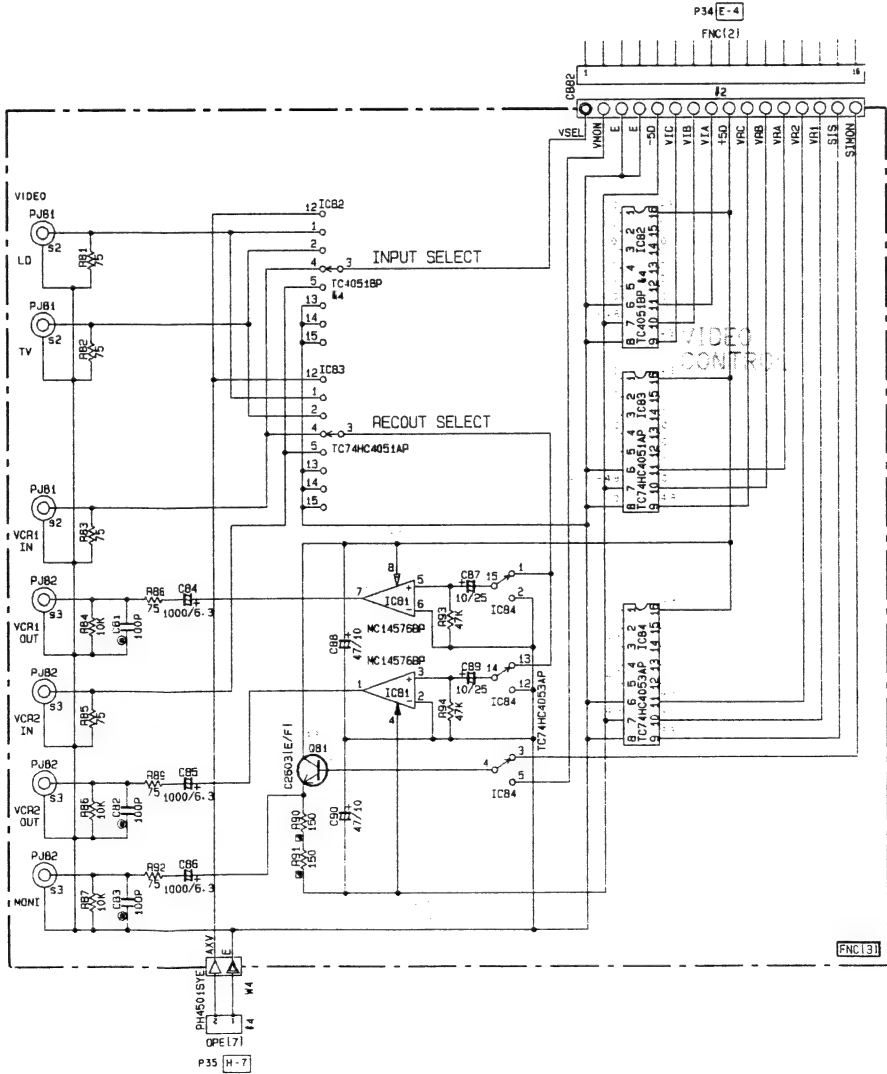


CONTROL INPUTS				"ON" CHANNEL
INHIBIT	C	B	A	
(Pin 6)	(Pin 9)	(Pin 10)	(Pin 11)	0X (Pin 12), 0Y (Pin 2), 0Z (Pin 5) 1X (Pin 13), 1Y (Pin 1), 1Z (Pin 3)
L	L	L	L	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	*	*	*	NONE

\* Don't Care

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
■	FIRE PROOF CARBON FILM RESISTOR
▣	CEMENT MOLDED RESISTOR
⊞	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	AXIAL LEAD CERAMIC CAPACITOR
⊖	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
①	MICA CAPACITOR
②	POLYPROPYLENE FILM CAPACITOR
⊕	SEMICONDUCTIVE CERAMIC CAPACITOR



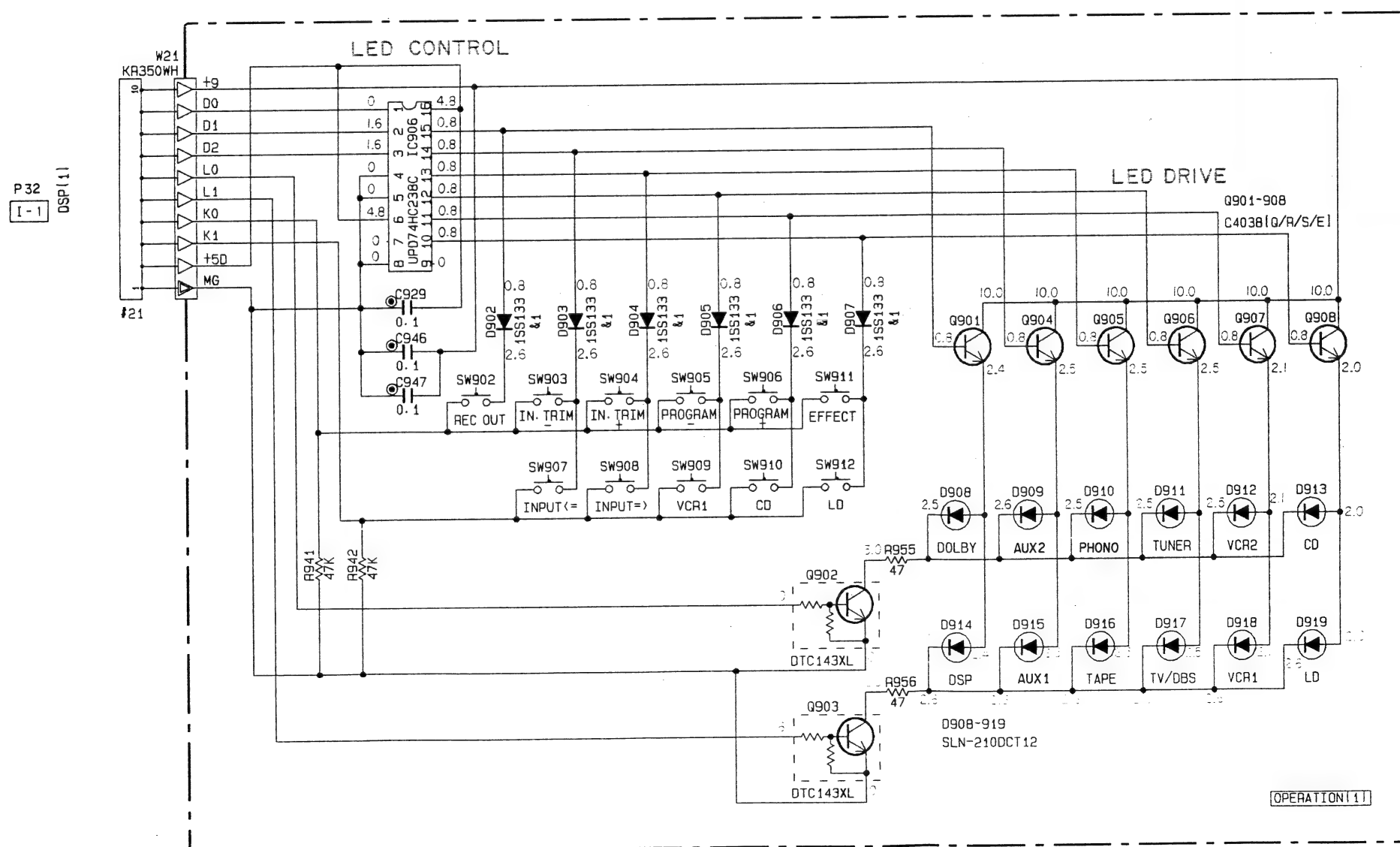
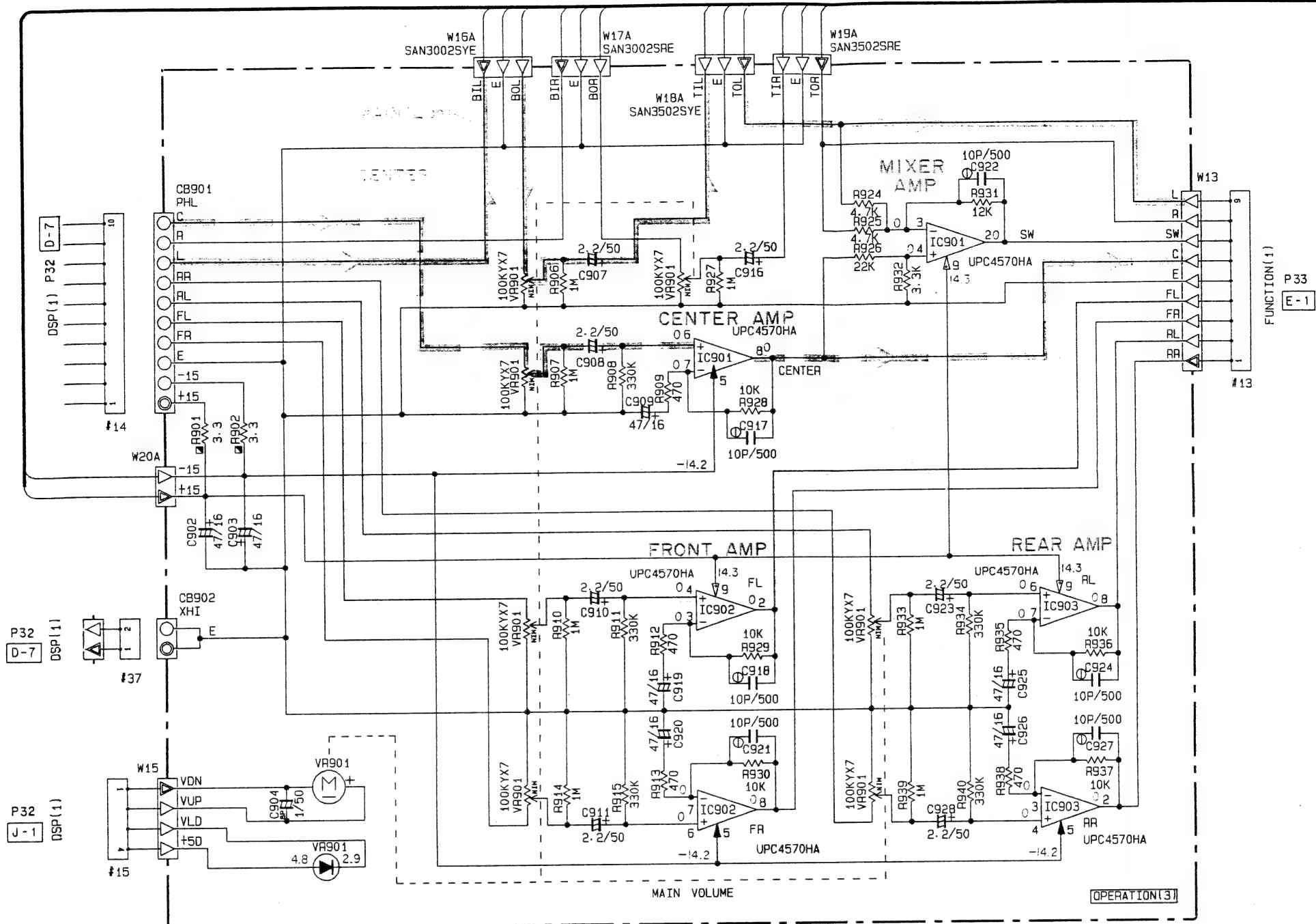
Conditions

- INPUT → LD
- INPUT TRIM → 0dB
- REC OUT → SOURCE
- PROGRAM → No.1 CONCERT HALL 1 (Hall A in Europe)

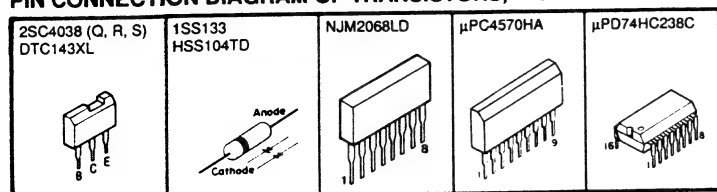
- \* All voltage are measured with a 10M $\Omega$ /V DC electric volt meter.
- \* Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.
- \* Schematic diagram is subject to change without notice.

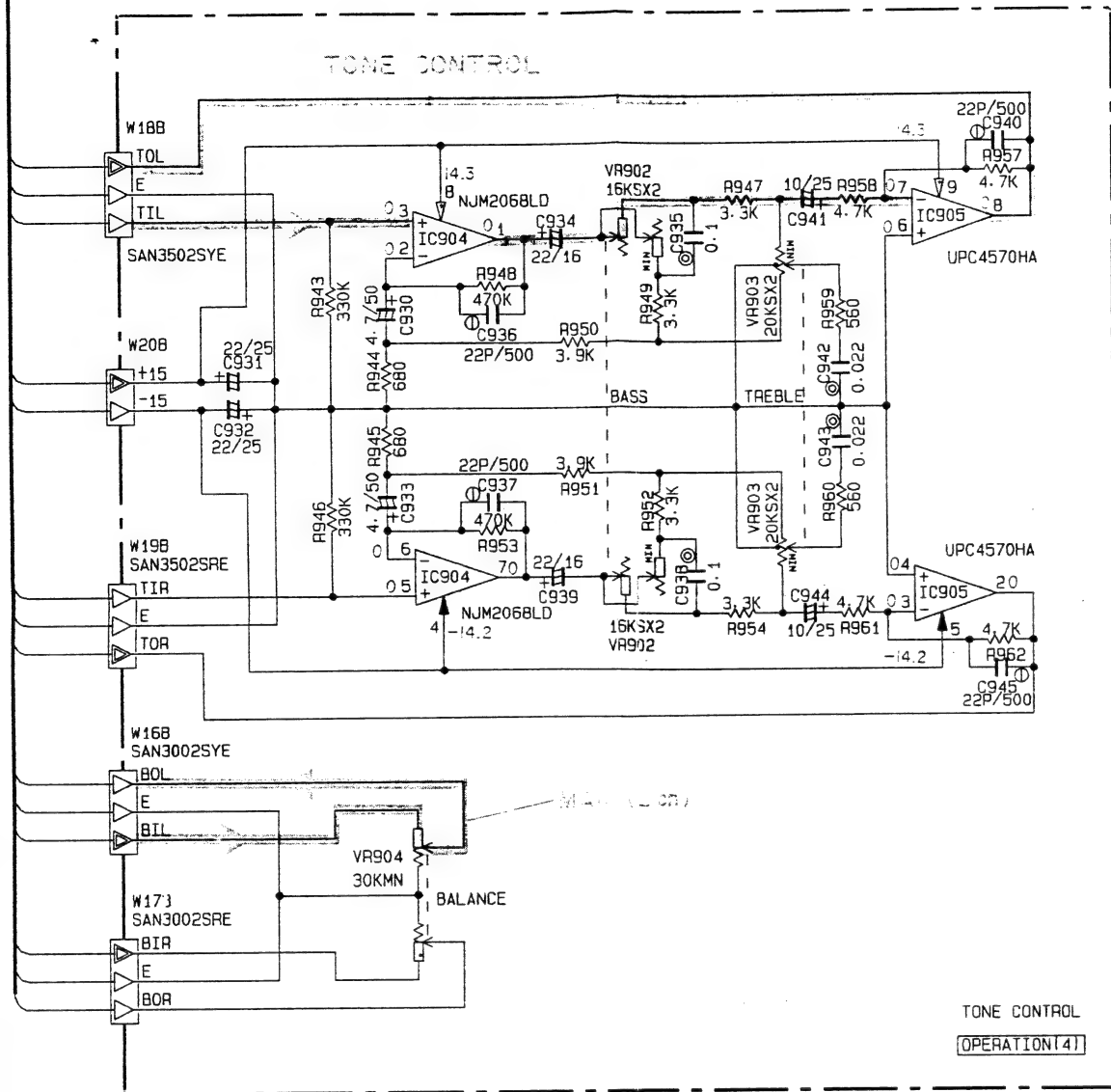
## DSP-A970

## ■ SCHEMATIC DIAGRAM (OPERATION)

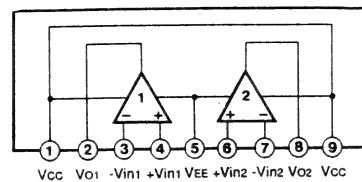


## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

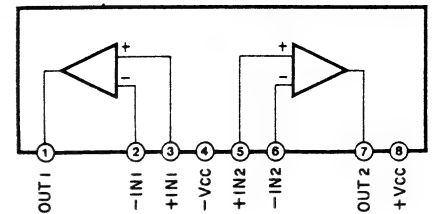




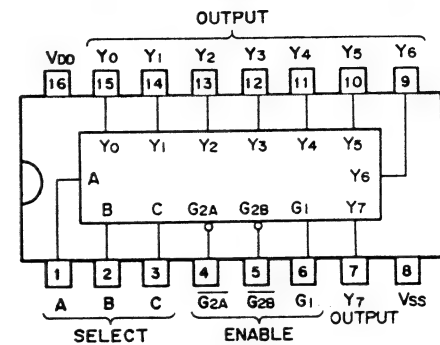
IC901~903, 905 : μPC4570HA  
Dual OP-Amp



IC904 : NJM2068LD  
Dual OP-Amp



IC906 : μPD74HC238C  
3 to 8 Line Decoder/Demultiplexer

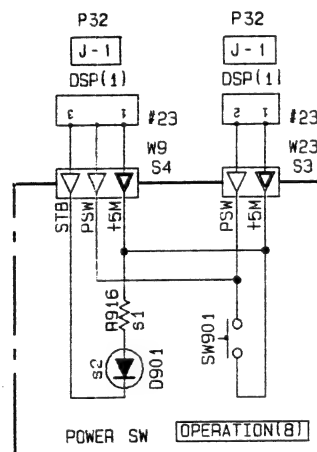
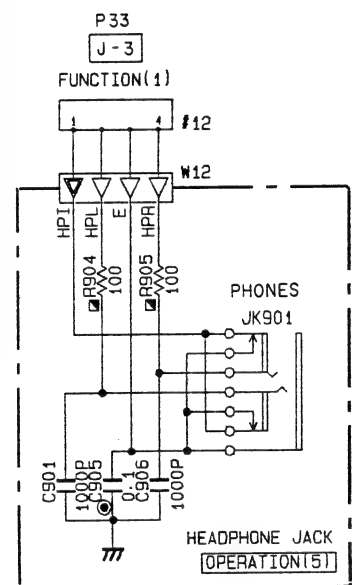


Truth Table

INPUT					OUTPUT								
ENABLE		SELECT											
G <sub>1</sub>	G <sub>2</sub> *	C	B	A	Y <sub>0</sub>	Y <sub>1</sub>	Y <sub>2</sub>	Y <sub>3</sub>	Y <sub>4</sub>	Y <sub>5</sub>	Y <sub>6</sub>	Y <sub>7</sub>	
X	H	X	X	X	L	L	L	L	L	L	L	L	
L	X	X	X	X	L	L	L	L	L	L	L	L	
H	L	L	L	L	H	L	L	L	L	L	L	L	
H	L	L	L	H	L	H	L	L	L	L	L	L	
H	L	L	H	L	L	L	H	L	L	L	L	L	
H	L	L	H	H	L	L	L	H	L	L	L	L	
H	L	H	L	L	L	L	L	L	H	L	L	L	
H	L	H	L	H	L	L	L	L	L	H	L	L	
H	L	H	H	L	L	L	L	L	L	L	H	L	
H	L	H	H	H	L	L	L	L	L	L	L	H	

$$G_2^* = G_2A \times G_2B$$

H: HIGH LEVEL L: LOW LEVEL X: H or L



s	Parts Number	J. U. C. R. A. B	G
1	R916	X	560
2	D901	X	SLR-34VC3H3
3	W23	O	X
4	W9	X	O
**	PWB	XM399	XM399
**	PCB	VQ14230	VQ14240

NOTE X : OPEN  
O : USE

Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
#1	D902-907	1SS133 HSS104TD
#2	U901	GP1U501X GP1U571X

#### RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
⊠	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊞	METAL PLATE RESISTOR
⊞	FIRE PROOF CARBON FILM RESISTOR
⊞	CEMENT MOLDED RESISTOR
⊞	SEMI VARIABLE RESISTOR
⊞	CHIP RESISTOR

#### CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	AXIAL LEAD CERAMIC CAPACITOR
⊙	POLYESTER FILM CAPACITOR
⊙	POLYSTYRENE FILM CAPACITOR
⊙	MICA CAPACITOR
⊙	POLYPROPYLENE FILM CAPACITOR
⊙	SEMICONDUCTIVE CERAMIC CAPACITOR

#### Conditions

- INPUT → LD
- INPUT TRIM → 0dB
- REC OUT → SOURCE
- PROGRAM → No.1 CONCERT HALL 1 (Hall A in Europe)

\* All voltage are measured with a 10MΩ/V DC electric volt meter.  
\* Components having special characteristics are marked ⊠ and must be replaced with parts having specifications equal to those originally installed.  
\* Schematic diagram is subject to change without notice.



# ■ SCHEMATIC DIAGRAM (MAIN)

	J	U.C.R	A-B	G
1 C416-417-420 422-425	X	X	X	0.01/100
2 C418-419-421 430-433	X	X	X	0.022
3 R518-524	X	X	X	2.2
4 F301-302	7A250V	7A125V	T6-3AL250V	T6-3AL250V
5 TE301-302	VK17660	VJ79260	VJ79260	VK17890
7 P.J301	VL55250	VL55260	VL55260	VL55260
9 P.J302-303	X	VJ13360	VJ13360	VJ13360
11 R307	1P120	1P120	1P120	1P120
15 C346-350-354	15P/500	15P/500	15P/500	22P/500
21 J501-504	○	○	○	○
22 J511-519	X	○	○	○
23 C326-329	X	470P/100	470P/100	470P/100
24 R340-343	X	220	220	220
25 R538-543	X	X	X	220
26 C434-436-439	X	X	X	3300P
27 J531-535	○	○	○	X
※ PWB	XN400	XN401	XN402	XN402
※ PCB	VQ14250	VQ14260	VQ14270	VQ14280

NOTE) X : OPEN  
○ : USE

## NOTICE

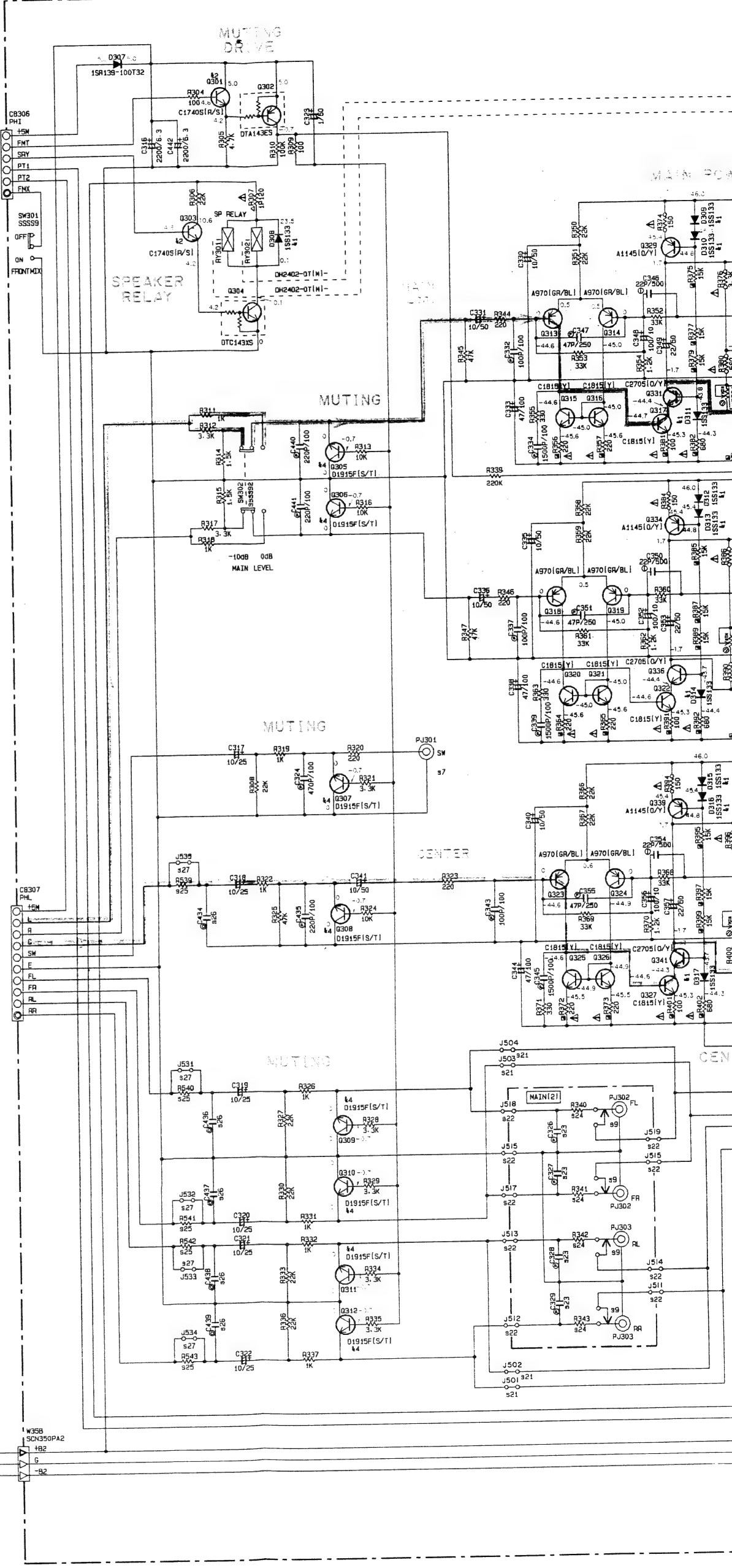
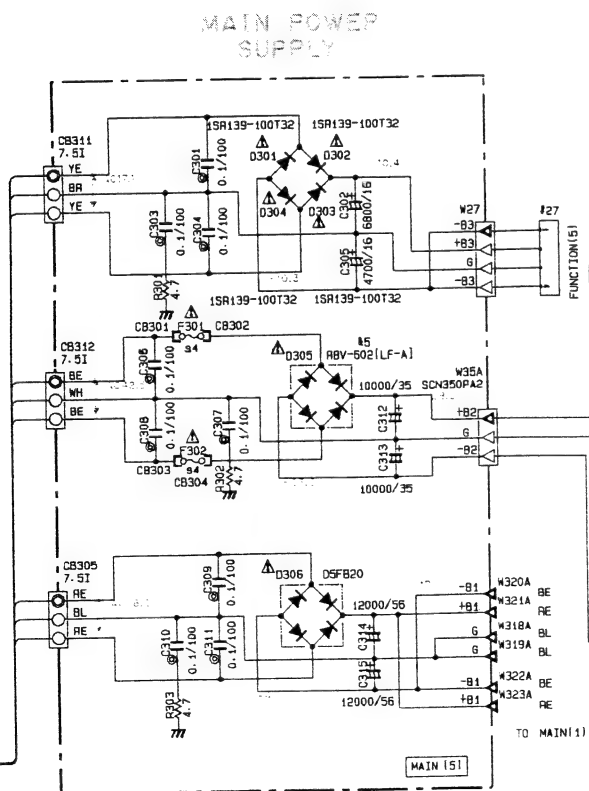
(J)..... Japanese model  
(U)..... U.S.A model  
(C)..... Canadian model  
(A)..... Australian model  
(G)..... European model  
(B)..... British model  
(R)..... General model  
(P)..... RP model

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
■	METAL PLATE RESISTOR
■	FIRE PROOF CARBON FILM RESISTOR
■	CEMENT MOLDED RESISTOR
■	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
●	AXIAL LEAD CERAMIC CAPACITOR
○	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
○	MICA CAPACITOR
○	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

## Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
k1	0308-319-322-325	1SS133 HSS104TD
k2	0301-303	2SC1740S(R/S) 2SC2603(E/F) 2SC3311A(G/R/S)
k3	0345-350-355-361-364 361-364	2SC2459(GR/BL) 2SC2240(GR/BL)
k4	0305-312	2SD1915F(S/T) 2SC2878(A/B)
k5	0305	RBV-602(LF-4) DS58A20

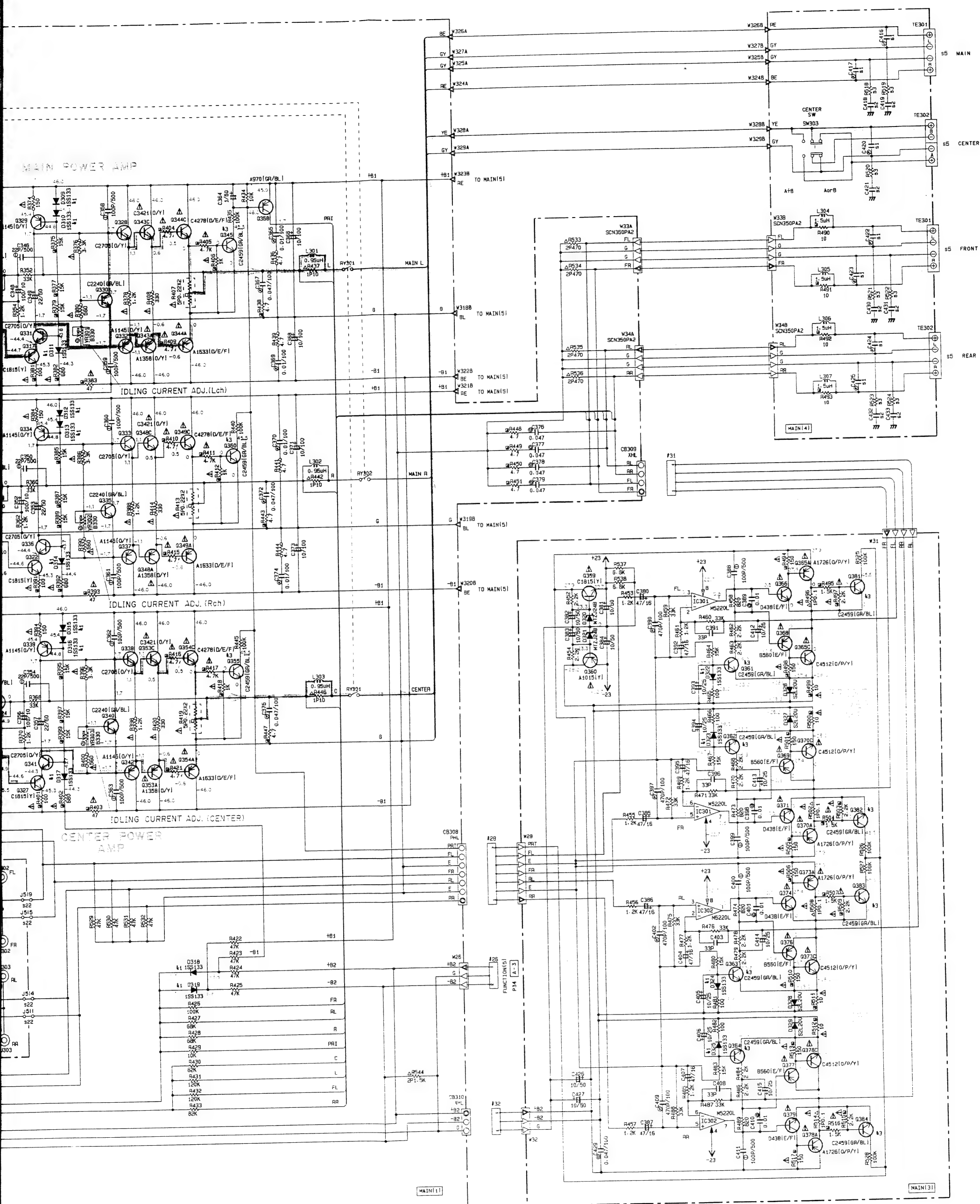


## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

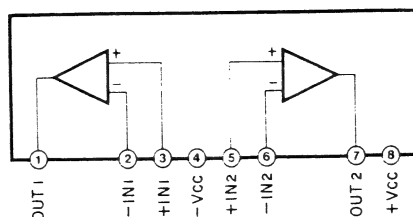
2SA970 (GR, BL) 2SA1015 (Y) 2SA1145 (O, Y) 2SB560 (E, F) 2SC1815 (Y) 2SC2240 (GR, BL) 2SC2705 (O, Y) 2SC2459 (GR, BL) 2SD438 (E, F) 2SC2878 (A, B)	2SC1740S (R, S) 2SC2603 (E, F) 2SC3311A (O, R, S) 2SD1915 (F, S, T) DTA143ES DTC143XS	2SA1726 (O, P, Y) 2SC4512 (O, P, Y)	2SA1358 (O, Y) 2SC3421 (O, Y)	2SA1633 (D, E, F) 2SC4278 (D, E, F)	1SS133 HSS104TD 1SR139-100 S2L20U MTZJ24.0B	D5FB20	RBV-602 DS58A20


## Conditions

- INPUT → LD
- INPUT TRIM → 0dB
- REC OUT → SOURCE
- PROGRAM → No.1 CONCERT H (Hall A in E)



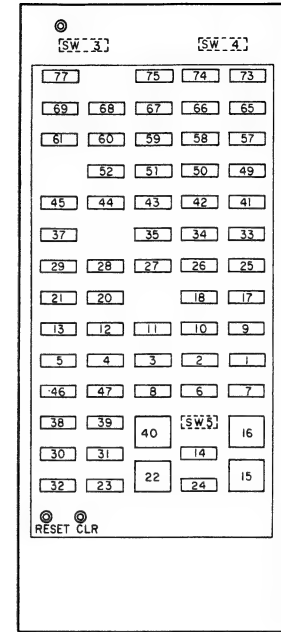
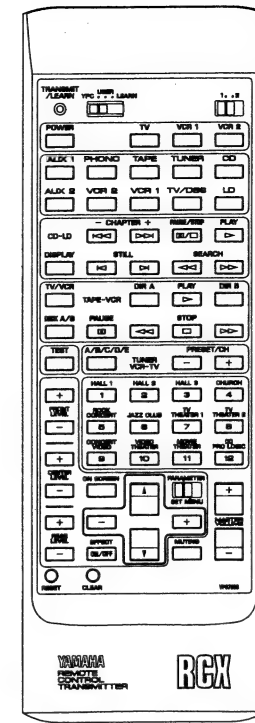
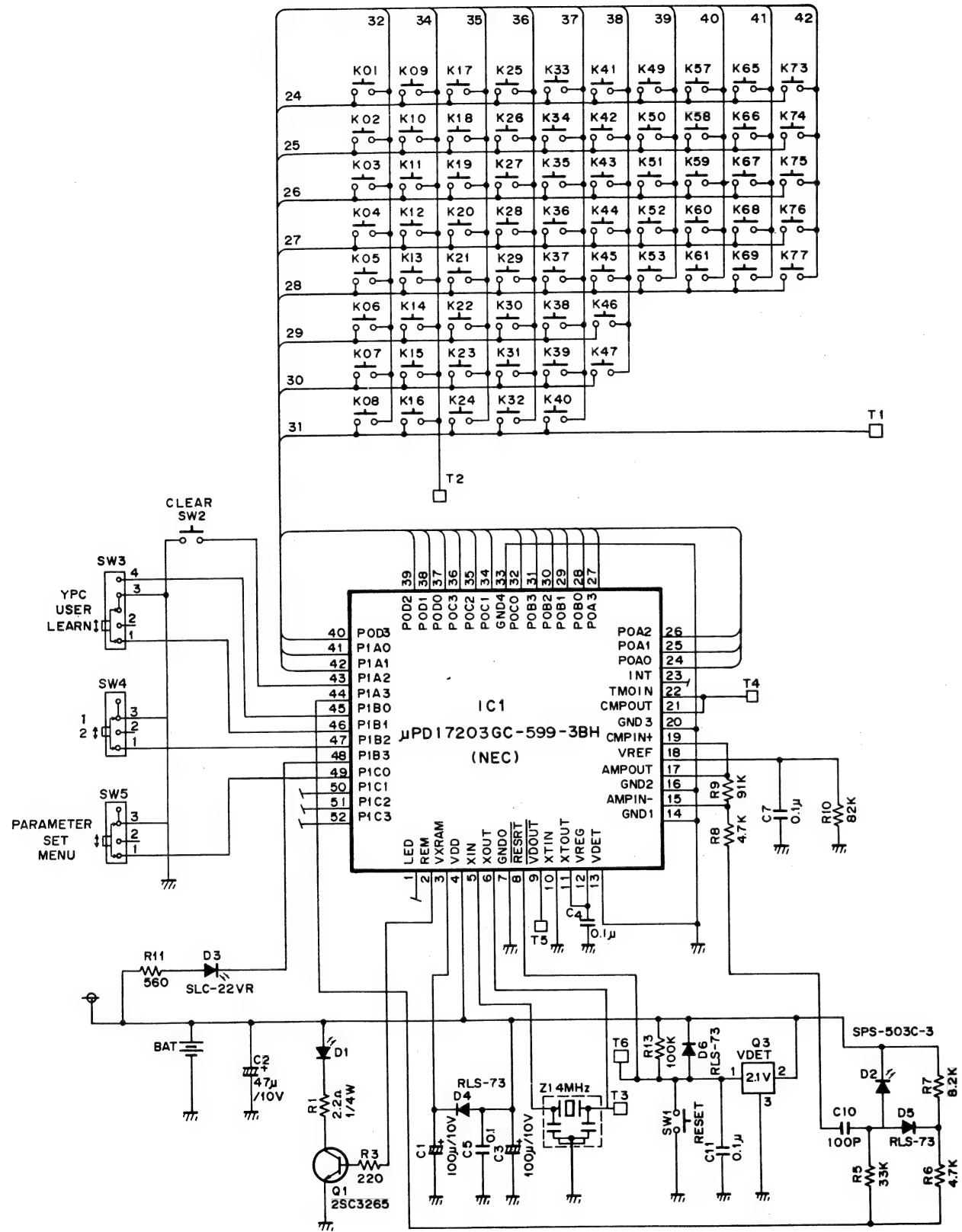
**IC301, 302 : M5220L**  
**Dual OP-Amp**



- \* All voltage are measured with a 10M $\Omega$ /V DC electric volt meter.
- \* Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.
- \* Schematic diagram is subject to change without notice.

# REMOTE CONTROL TRANSMITTER

## ■ SCHEMATIC DIAGRAM



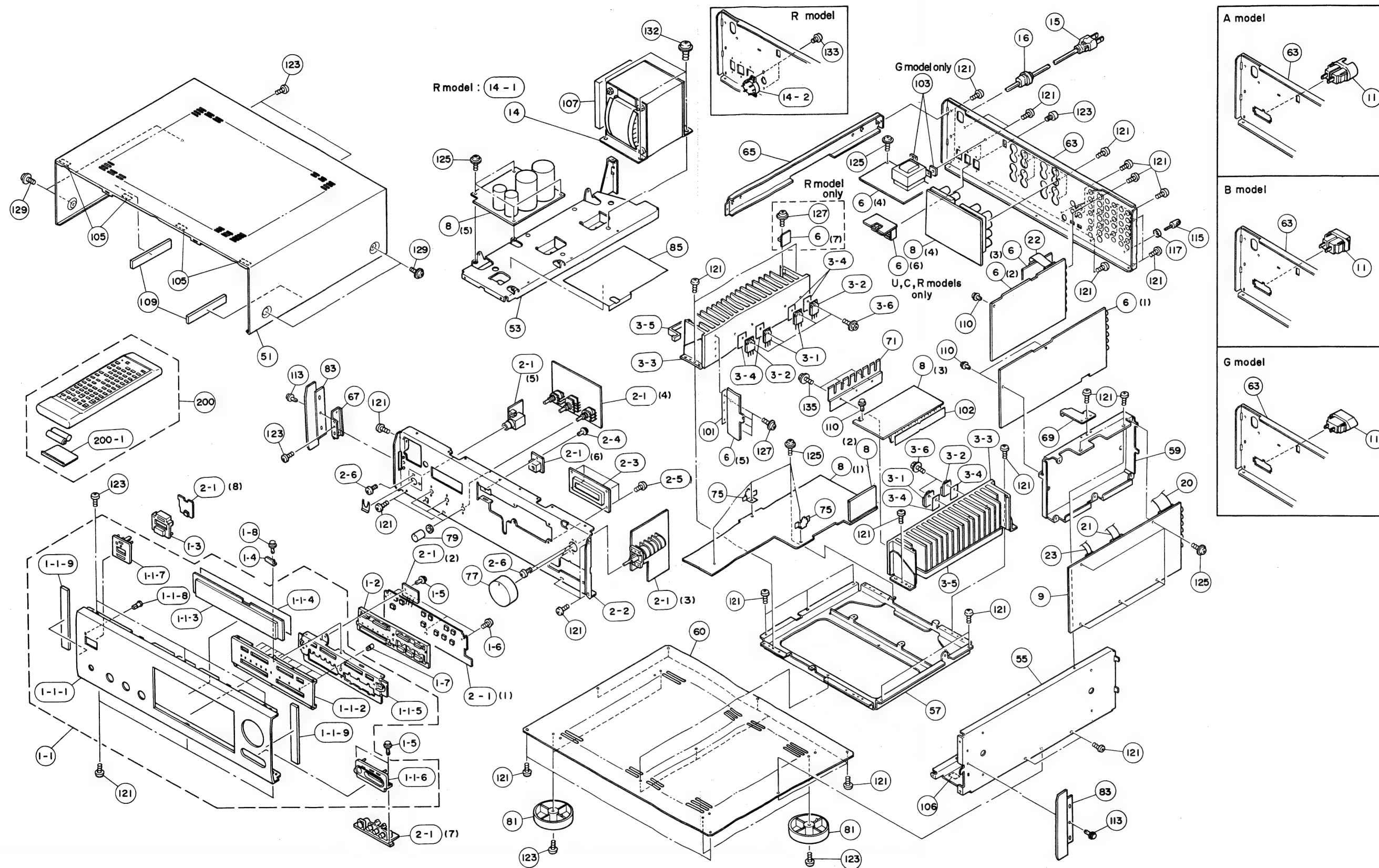
KEY No.	CONTROL CODE	FUNCTION
SW 4	1 2	
77	7D-8F	POWER
75	—	TV
74	—	VCR 1
73	—	VCR 2
69	7D-8A	INPUT AUX 1
68	7D-88	PHONO
67	7D-8B	TAPE
66	7D-89	TUNER
65	7D-87	CD
61	7D-85	AUX 2
60	7D-82	VCR 2
59	7D-81	VCR 1
58	7D-84	TV/DBS
57	7D-83	LD
52	7A-0B 7C-02	SKIP/CHAPTER -
51	7A-0A 7C-03	SKIP/CHAPTER +
50	7A-09 7C-04	PAUSE/STOP
49	7A-08 7C-05	PLAY
45	7A-0A 7C-13	DISPLAY
44	—	7C-0A STILL

KEY No.	CONTROL CODE	FUNCTION
SW 4	1 2	
43	—	7C-0B STILL
42	7A-0D 7C-06	SEARCH
41	7A-0C 7C-07	SEARCH
37	—	TV/VCR
35	7A-07	DIR A
34	7A-00	PLAY
33	7A-40	DIR B
29	7A-06	DECK A/B
28	—	PAUSE
27	7A-01	◀
26	7A-03	STOP
25	7A-02	▶
21	7D-CA	TEST
20	7A-12	TUNER A/B/C/D/E
18	7A-11	PRESET -
17	7A-10	PRESET +
13	7D-CD	FRONT LEVEL +
12	7D-D0	PROGRAM 1
11	7D-D1	PROGRAM 2
10	7D-D2	PROGRAM 3

KEY No.	CONTROL CODE	FUNCTION
SW 4	1 2	
9	7D-D3	PROGRAM 4
5	7D-CE	FRONT LEVEL -
4	7D-D4	PROGRAM 5
3	7D-D5	PROGRAM 6
2	7D-D6	PROGRAM 7
1	7D-D7	CENTER LEVEL +
46	7D-CB	PROGRAM 8
47	7D-D8	PROGRAM 9
8	7D-D9	PROGRAM 10
6	7D-DA	PROGRAM 11
7	7D-DB	PROGRAM 12
38	7D-CC	CENTER LEVEL -
39	7D-C2	ON SCREEN
16	7D-8D	MASTER VOLUME +
30	7D-C8	REAR LEVEL +
32	7D-C9	REAR LEVEL -
23	7D-C1	EFFECT ON/OFF
24	7D-94	MUTING -20dB
15	7D-8E	MASTER VOLUME -

KEY No.	CONTROL CODE	FUNCTION
SW 5	PARAMETER SET MODE	
40	7D-C5 7D-9D	PARAMETER SET MENU ↑
31	7D-C7 7D-9F	PARAMETER SET MENU -
14	7D-C6 7D-9E	PARAMETER SET MENU +
22	7D-C4 7D-9C	PARAMETER SET MENU ↓

■ EXPLODED VIEW





**MECHANICAL PARTS** Note ) Ø : Diameter

Ref. No.	PART NO.	Description	Remarks	Markets
* 1-1	VQ143900	FRONT PANEL ASS'y	BL	(UCRAB)
* 1-1	VQ144000	FRONT PANEL ASS'y	BL	(G)
* 1-1	VQ146500	FRONT PANEL ASS'y	TI	(G)
* 1-1-1	VP869400	FRONT PANEL	BL	(UCRAB)
* 1-1-1	VP869600	FRONT PANEL	BL	(G)
* 1-1-1	VP869700	FRONT PANEL	TI	(G)
* 1-1-2	VP870000	SUB PANEL	BL	
* 1-1-2	VP870100	SUB PANEL	TI	
* 1-1-3	VP870400	WINDOW PANEL		
* 1-1-4	VP993400	SHEET, WINDOW		
* 1-1-5	VP870500	FRAME		
* 1-1-6	VP868300	ESCUTCHEON	BL	
* 1-1-6	VP868400	ESCUTCHEON	TI	
* 1-1-7	VP868800	BUTTON GUIDE	BL	
* 1-1-7	VP868900	BUTTON GUIDE	TI	
* 1-1-8	VH897700	LENS		(G)
* 1-1-9	VQ363700	CUSHION, SIDE		
* 1-2	VP870200	BUTTON CASE	BL	
* 1-2	VP870300	BUTTON CASE	TI	
* 1-3	VP868500	BUTTON	BL	
* 1-3	VP868600	BUTTON	TI	
* 1-4	VQ321200	SUPPORT, WINDOW		
* 1-5	CB605620	PLASTIC RIVET	No.1781	
* 1-6	Ei330086	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL	
* 1-7	Vi777100	LENS		
* 1-8	CB068880	PLASTIC RIVET	No.1027	
* 2-1	VQ142300	P.C.B. ASS'y OPERATION		(UCRAB)
* 2-1	VQ142400	P.C.B. ASS'y OPERATION		(G)
* 2-2	VP866800	SUB CHASSIS		
* 2-3	VP332900	LCD	DM061Y-7DL3	
* 2-4	CB605620	PLASTIC RIVET	No.1781	
* 2-5	VC298900	BIND HEAD B-TITE SCREW	2.6x6 +/- FCRM3-BL	
* 2-6	EX601890	BIND HEAD BONDING SCREW	3x6 FCRM3-BL	
Δ 3-1	ix632650	TRANSISTOR	2SA1633 D,E,F	Q344A, 349A, 354A
Δ 3-2	ix632660	TRANSISTOR	2SC4278 D,E,F	Q344C, 349C, 354C
* 3-3	VP868200	HEAT SINK		
* 3-4	VK195900	SHEET	19x24	
* 3-5	VK706700	DAMPER	FIN	
* 3-6	VK173200	SCREW, TRANSISTOR	3x15 SP FCM3	
* 6	VQ141900	P.C.B. ASS'y FUNCTION		(UC)
* 6	VQ142000	P.C.B. ASS'y FUNCTION		(R)
* 6	VQ142100	P.C.B. ASS'y FUNCTION		(AB)
* 6	VQ142200	P.C.B. ASS'y FUNCTION		(G)
* 8	VQ142600	P.C.B. ASS'y MAIN		(UCR)
* 8	VQ142700	P.C.B. ASS'y MAIN		(AB)
* 8	VQ142800	P.C.B. ASS'y MAIN		(G)
* 9	VQ143000	P.C.B. ASS'y DSP		(UC)
* 9	VQ143100	P.C.B. ASS'y DSP		(R)
* 9	VQ143200	P.C.B. ASS'y DSP		(AB)
* 9	VQ143300	P.C.B. ASS'y DSP		(G)
Δ 11	VJ775000	AC OUTLET	2P	(B)
Δ 11	VJ775100	AC OUTLET	S2-729T	(A)
Δ 11	VP418700	AC OUTLET	2P	(G)

\* New Parts

Ref. No.	PART NO.	Description	Remarks	Markets
Δ *	14	XM361A00	POWER TRANSFORMER	(U)
Δ *	14	XM362A00	POWER TRANSFORMER	(C)
Δ *	14	XM364A00	POWER TRANSFORMER	(AB)
Δ *	14	XM365A00	POWER TRANSFORMER	(G)
Δ *	14-1	XM363A00	POWER TRANSFORMER	(R)
Δ	14-2	Vi449800	VOLTAGE SELECTOR	(R)
Δ	15	MG002220	POWER CORD	(UC)
Δ	15	MG002320	POWER CORD	(G)
Δ	15	VK815400	POWER CORD	(B)
Δ	15	VL948500	POWER CORD	(R)
Δ	15	VP417900	POWER CORD	(A)
	16	CB620190	CORD STOPPER	(RABG)
	16	CB620200	CORD STOPPER	(UC)
	17	CB069250	BINDING TIE	
*	20	VQ120500	CONNECTOR, FLAT CABLE	
*	21	VQ120600	CONNECTOR, FLAT CABLE	
*	22	VQ157200	CONNECTOR, FLAT CABLE	
*	23	VQ157100	CONNECTOR, FLAT CABLE	
*	51	VP866000	TOP COVER	BL
*	51	VP866100	TOP COVER	TI
*	53	VP866300	FRAME	L
*	55	VP866400	FRAME	R
*	57	VP866500	FRAME	CENTER
*	59	VP866900	SHIELD CASE	
*	60	VP866200	BOTTOM COVER	
*	61	VQ199200	SIDE PANEL	
*	63	VP867500	REAR PANEL	(UC)
*	63	VP867600	REAR PANEL	(R)
*	63	VP867700	REAR PANEL	(AB)
*	63	VP867800	REAR PANEL	(G)
*	65	VP866700	FRAME	SIDE
*	67	VP867000	SUPPORT	SIDE
*	69	VP867100	SUPPORT	PCB
*	71	VP867200	SUPPORT	TR
	75	VK839200	TR. PUSHER	
	77	VK015100	KNOB, LED	Ø45
	77	VL864400	KNOB, LED	Ø45
	79	VP511700	KNOB	Ø14
*	79	VQ042400	KNOB	Ø14
	81	VK016500	LEG	Ø60xH21
	83	VK234600	PLATE SIDE	
	83	VK234700	PLATE SIDE	
*	85	VQ233900	SHIELD PLATE	
*	101	VP869100	SHEET, RADIATOR	20x57.5
*	102	VQ746900	SHEET, RADIATOR	20x115
	103	Vi707300	DAMPER	
	105	VE222600	CUSHION	
	106	VQ354800	CUSHION	VOL
*	107	VQ199500	DAMPER	TRANS.
*	109	VQ988100	DAMPER	SIDE
	110	CB605620	PLASTIC RIVET	No.1781
	113	CB099600	PLASTIC RIVET	No.920
	115	AA627310	GROUND TERMINAL	

\* New Parts

Ref. No.	PART NO.	Description	Remarks	Markets
117	EV265560	PLAIN WASHER	3.6x10x0.8FNM3-3G	
121	EN301010	BIND HEAD BONDING TAP. SCREW	3x8 FCRM3-BL	
123	Ei330086	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL	
125	EX600700	BW HEAD TAPPING SCREW	3x8 FCM3-CU	
127	EX600250	CUP B-TITE SCREW	3x10 FCRM3-BL	
129	EL300470	BW HEAD S-TITE SCREW	4x8-10 FCRM3-BL	BL
129	EX601150	BW HEAD S-TITE SCREW	4x8-10 FNM3-BL	TI
132	VK625000	CUP S-TITE SCREW	5x10-12 ZMC2-Y	
133	ED330066	BIND HEAD SCREW	3x6 FCRM3-BL	
135	VK173200	SCREW, TRANSISTOR	3x15 SP FCM3	(R)
* 200	ACCESSORIES			
	VP373500	REMOTE CONTROL TRANSMITTER		
	200-1 CX674400	LID	56x40.5SMK	103RRC-031-02R
	201 CX618490	SHEET, REMOTE CONTROL BATTERY, MANGANESE	SUM-3, AA, R06	

\* New Parts

PARTS LIST

ELECTRICAL PARTS

WARNING

Components having special characteristics are marked  $\triangle$  and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	: CHIP ALUMI. ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR, CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR, DIN	SCR.TR	: SCREW, TRANSISTOR
CN.FLAT	: CONNECTOR, FLAT CABLE	SUPRT.PCB	: SUPPORT, P.C.B.
CN.POST	: CONNECTOR, BASE POST	SURG.PRTC	: SURGE PROTECTOR
COIL.MX.AM	: COIL, AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'y
FLTR.LC.RF	: LC FILTER, EMI	TUNER.AM	: TUNER PACK, AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK, FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTC	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER, TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

Note) Those parts marked with "#" are not included in the P.C.B. ass'y.

## FUNCTION P. C. B.

Schm Ref.	PART NO.	Description
* VQ141900	P.C.B.	FUNCTION(UC)
* VQ142000	P.C.B.	FUNCTION(R)
* VQ142100	P.C.B.	FUNCTION(AB)
* VQ142200	P.C.B.	FUNCTION(G)
* CB2	VN923700	CN FE 16P TE
* CB3	VN923300	CN FE 12P TE
* CB82	VN923700	CN FE 16P TE
* CB101	VN924900	CN FE 28P TE
* CB102	VN923100	CN FE 10P TE
CB103	VD005200	CN.BS.PIN PH i-TYPE 9P TE
CB104	VD004700	CN.BS.PIN PH i-TYPE 4P TE
CB201	LA003870	TERM.WRAP 2P L-TYPE P=10
CB202	LA002140	TERM.WRAP 2P i-TYPE P=10(UC)
CB203	LA002150	TERM.WRAP 3P i-TYPE P=10(R)
CB204	LA002110	TERM.WRAP 2P i-TYPE P=5 (R)
CB205	LA002140	TERM.WRAP 2Pi-TYPE P=10(ABG)
CB206	LA002140	TERM.WRAP 2Pi-TYPE P=10(ABG)
CB207	VD004600	CN.BS.PIN PH i-TYPE 3P TE
CB209	LB201880	HOLDER.FUS PC-FH1
CB210	LB201880	HOLDER.FUS PC-FH1
CB211	LB201880	HOLDER.FUS PC-FH1(RG)
CB212	LB201880	HOLDER.FUS PC-FH1(RG)
CB221	VB858600	CN.BS.PIN PH L-TYPE 7P SE
CB222	VB858100	CN.POST PH 2P SE
CB223	VB858300	CN.POST PH 4P SE
CB224	VB858200	CN.BS.PIN PH L-TYPE 3P SE
C1	Vi845900	C.EL 10uF 63V
C2	Vi841400	C.EL 1000uF 6.3V
C3	VF466800	C.CE.TUBLR 100pF 50V
C4	VF466800	C.CE.TUBLR 100pF 50V
C5	Vi845900	C.EL 10uF 63V
C6	Vi841400	C.EL 1000uF 6.3V
C7	VF466800	C.CE.TUBLR 100pF 50V
C8	VF466800	C.CE.TUBLR 100pF 50V
C9	Vi845900	C.EL 10uF 63V
C10	VF466800	C.CE.TUBLR 100pF 50V
C11	VF466800	C.CE.TUBLR 100pF 50V
C12	VG279600	C.CE.TUBLR 3300pF 16V
C13	Vi841400	C.EL 1000uF 6.3V
C14	Vi845900	C.EL 10uF 63V
C15	Vi845900	C.EL 10uF 63V
C16	Vi845900	C.EL 10uF 63V
C17	Vi845900	C.EL 10uF 63V
C18	Vi845600	C.EL 47uF 50V
C19	Vi845600	C.EL 47uF 50V
C20	VG279000	C.CE.TUBLR 820pF 50V
C21	Vi841300	C.EL 470uF 6.3V
C22	Vi845600	C.EL 47uF 50V
C23	VJ599100	C.CE.TUBLR 0.1uF 50V
C24	VJ599100	C.CE.TUBLR 0.1uF 50V
C25	VG277000	C.CE.TUBLR 33pF 50V
C26	VG277000	C.CE.TUBLR 33pF 50V
C27	Vi846000	C.EL 22uF 63V

\* New Parts

Schm Ref.	PART NO.	Description
C28	VH620800	C.EL 47uF 25V
C29	VF467300	C.CE.TUBLR 0.01uF 16V
C30	Vi845900	C.EL 10uF 63V
C31	VG276600	C.CE.TUBLR 22pF 50V
C32	VG276600	C.CE.TUBLR 22pF 50V
C33	Vi845200	C.EL 4.7uF 50V
C34	VG278400	C.CE.TUBLR 220pF 50V
C35	VG278100	C.CE.TUBLR 120pF 50V
C36	Vi845600	C.EL 47uF 50V
C37	VG279000	C.CE.TUBLR 820pF 50V
C38	Vi845900	C.EL 10uF 63V
C39	VG277000	C.CE.TUBLR 33pF 50V
C40	VF466900	C.CE.TUBLR 470pF 50V
C41	Vi845200	C.EL 4.7uF 50V
C42	VJ599100	C.CE.TUBLR 0.1uF 50V
C43	Vi841900	C.EL 220uF 10V
C81	VF466800	C.CE.TUBLR 100pF 50V
C82	VF466800	C.CE.TUBLR 100pF 50V
C83	VF466800	C.CE.TUBLR 100pF 50V
C84	Vi841400	C.EL 1000uF 6.3V
C85	Vi841400	C.EL 1000uF 6.3V
C86	Vi841400	C.EL 1000uF 6.3V
C87	Vi845900	C.EL 10uF 63V
C88	Vi845600	C.EL 47uF 50V
C89	Vi845900	C.EL 10uF 63V
C90	Vi845600	C.EL 47uF 50V
C101	UT452470	C.PP 470pF 100V
C102	UT452470	C.PP 470pF 100V
C103	UT452470	C.PP 470pF 100V
C104	UT452470	C.PP 470pF 100V
C105	UT452470	C.PP 470pF 100V
C106	UT452470	C.PP 470pF 100V
C107	UT452470	C.PP 470pF 100V
C108	UT452470	C.PP 470pF 100V
C109	UT452470	C.PP 470pF 100V
C110	UT452470	C.PP 470pF 100V
C111	UT452470	C.PP 470pF 100V
C112	UT452470	C.PP 470pF 100V
C113	Vi845600	C.EL 47uF 50V
C114	Vi845600	C.EL 47uF 50V
C115	Vi845600	C.EL 47uF 50V
C116	UA654330	C.MYLAR 0.033uF 50V
C117	UA654100	C.MYLAR 0.01uF 50V
C118	UA653270	C.MYLAR 2700pF 50V
C119	UA652820	C.MYLAR 820pF 50V
C120	UT452180	C.PP 180pF 100V
C121	FU451330	C.MICA 33pF 500V
C122	Vi844900	C.EL 1uF 50V
C123	Vi844700	C.EL 0.33uF 50V
C124	Vi844500	C.EL 0.1uF 50V
C125	UA654330	C.MYLAR 0.033uF 50V
C126	UA654100	C.MYLAR 0.01uF 50V
C127	Vi845600	C.EL 47uF 50V

\* New Parts



FUNCTION P. C. B.

Schm Ref.	PART NO.	Description
C128	Vi845200	C.EL 4.7uF 50V
C129	Vi844700	C.EL 0.33uF 50V
C130	Vi845900	C.EL 10uF 63V
C131	Vi845200	C.EL 4.7uF 50V
C132	Vi845900	C.EL 10uF 63V
C133	Vi845900	C.EL 10uF 63V
C134	Vi845900	C.EL 10uF 63V
C135	Vi845900	C.EL 10uF 63V
C136	Vi844500	C.EL 0.1uF 50V
C137	Vi844500	C.EL 0.1uF 50V
C138	Vi845600	C.EL 47uF 50V
C139	Vi844900	C.EL 1uF 50V
C140	FU451330	C.MICA 33pF 500V
C141	FU451330	C.MICA 33pF 500V
C142	Vi845900	C.EL 10uF 63V
C143	Vi844500	C.EL 0.1uF 50V
C144	Vi844500	C.EL 0.1uF 50V
C145	Vi845600	C.EL 47uF 50V
C146	Vi845600	C.EL 47uF 50V
C147	Vi845600	C.EL 47uF 50V
C148	Vi845600	C.EL 47uF 50V
C149	Vi845600	C.EL 47uF 50V
C150	VF466800	C.CE.TUBLR 100pF 50V
C151	VF466800	C.CE.TUBLR 100pF 50V
C152	Vi845600	C.EL 47uF 50V
C153	Vi844900	C.EL 1uF 50V
C154	Vi845900	C.EL 10uF 63V
C155	Vi844500	C.EL 0.1uF 50V
C156	Vi844500	C.EL 0.1uF 50V
C157	Vi845600	C.EL 47uF 50V
C158	VF466700	C.CE.TUBLR 47pF 50V
C159	VF466700	C.CE.TUBLR 47pF 50V
C160	VG278400	C.CE.TUBLR 220pF 50V
C161	VG278400	C.CE.TUBLR 220pF 50V
C162	Vi844900	C.EL 1uF 50V
C163	Vi845900	C.EL 10uF 63V
C164	Vi845900	C.EL 10uF 63V
C165	Vi845900	C.EL 10uF 63V
C166	Vi844500	C.EL 0.1uF 50V
C167	Vi844500	C.EL 0.1uF 50V
C168	Vi845600	C.EL 47uF 50V
C169	VK180400	C.EL 1000uF 16V
C170	VK180400	C.EL 1000uF 16V
C171	Vi845900	C.EL 10uF 63V
C172	Vi845900	C.EL 10uF 63V
C173	Vi845900	C.EL 10uF 63V
C174	Vi845900	C.EL 10uF 63V
C175	Vi845900	C.EL 10uF 63V
C176	Vi845900	C.EL 10uF 63V
C177	Vi845900	C.EL 10uF 63V
C178	Vi845900	C.EL 10uF 63V
C179	Vi844500	C.EL 0.1uF 50V
C180	Vi844500	C.EL 0.1uF 50V

\* New Parts

Schm Ref.	PART NO.	Description
C181	Vi845600	C.EL 47uF 50V
C201	UG444100	C.CE 0.01uF 50V
C202	UG444100	C.CE 0.01uF 50V
△ C203	Fi414100	C.CE.SAFTY 0.01uF VA-1
C204	VK206300	C.EL 820uF 25V
C205	Vi846200	C.EL 47uF 63V(R)
C206	FG213100	C.CE 1000pF 50V(R)
C207	Fi383470	C.CE.SAFTY 4700pF 400V(G)
C208	Fi383470	C.CE.SAFTY 4700pF 400V(G)
C209	Fi383470	C.CE.SAFTY 4700pF 400V(G)
C210	Fi383470	C.CE.SAFTY 4700pF 400V(G)
C221	Vi845600	C.EL 47uF 50V
C222	Vi845600	C.EL 47uF 50V
C223	Vi842900	C.EL 470uF 16V
C224	Vi842900	C.EL 470uF 16V
C225	Vi842900	C.EL 470uF 16V
C226	Vi842900	C.EL 470uF 16V
C227	Vi845900	C.EL 10uF 63V
C228	Vi845900	C.EL 10uF 63V
C229	Vi845900	C.EL 10uF 63V
C230	Vi845900	C.EL 10uF 63V
D1	iF004600	DIODE 1SS133
D2	iF004600	DIODE 1SS133
D3	iF004600	DIODE 1SS133
D4	VG435100	DIODE.ZENR MTZJ2B 2.0V
D5	iF004600	DIODE 1SS133
D6	iF004600	DIODE 1SS133
D7	iF004600	DIODE 1SS133
D8	iF004600	DIODE 1SS133
D9	iF004600	DIODE 1SS133
D101	VG438400	DIODE.ZENR MTZJ6.8C 6.8V
D102	VG438400	DIODE.ZENR MTZJ6.8C 6.8V
D103	VG437400	DIODE.ZENR MTZJ5.1B 5.1V
D104	iF004600	DIODE 1SS133
D105	VH770800	DIODE 1SR139-100
D106	VH770800	DIODE 1SR139-100
D107	iF004600	DIODE 1SS133
D108	iF004600	DIODE 1SS133
△ D201	VH770800	DIODE 1SR139-100
D202	iF004600	DIODE 1SS133
D203	VG440400	DIODE.ZENR MTZJ13A 13V(R)
D221	VH770800	DIODE 1SR139-100
△ F201	KB000760	FUSE T3.15A 250V(ABG)
△ F201	KB001300	FUSE T7.0A 250V(R)
△ F201	Vi721000	FUSE 8A 250V(UC)
△ F202	KB000760	FUSE T3.15A 250V(R)
△ F202	KB002980	FUSE T2.5A 250V(G)
IC1	Xi109C00	IC MC14576BP
IC2	Xi109C00	IC MC14576BP
IC3	iG001770	IC TC4051BP
IC4	XL493A00	IC TC74HC4051AP
IC5	iG001770	IC TC4051BP
IC6	iG001770	IC TC4051BP

\* New Parts

## FUNCTION &amp; MAIN P. C. B.

Schm Ref.	PART NO.	Description
IC7	iG055100	IC TC4053BP
IC8	iR405300	IC TC74HC4053AP
IC9	XL314A00	IC M35010-062SP
IC10	iG142200	IC TC74HC04AP
IC11	iG001720	IC TC4069UBP
IC81	Xi109C00	IC MC14576BP
IC82	iG001770	IC TC4051BP
IC83	XL493A00	IC TC74HC4051AP
IC84	iR405300	IC TC74HC4053AP
IC101	XG732A00	IC LC7821N
IC102	XG732A00	IC LC7821N
IC103	XG758A00	IC LC7823N
IC104	XB247301	IC uPC4570HA
IC105	XB247301	IC uPC4570HA
IC106	XB247301	IC uPC4570HA
IC107	Xi113A00	IC LC7522
IC108	XE536001	IC LC7535
IC109	XF971A00	IC uPC4574C
IC110	iG055100	IC TC4053BP
IC111	XB247301	IC uPC4570HA
IC112	XE536001	IC LC7535
IC113	XF971A00	IC uPC4574C
IC114	iG077400	IC NJM4556S
IC115	XE536001	IC LC7535
IC116	XB247301	IC uPC4570HA
△ IC221	XJ603A00	IC NJM78M15FA
△ IC222	XG505A00	IC NJM79M15FA
△ IC223	XJ604A00	IC NJM78M05FA
△ IC224	XE436A00	IC NJM79M05FA
JK1	VP113600	CN.DIN 2P YKF51-5510
JK2	VP113600	CN.DIN 2P YKF51-5510
JK3	VN938200	JACK.DIN 3P,S
L1	VM703900	COIL 15uH
L201	VB100200	COIL 10uH
L202	VB100200	COIL 10uH
PJ81	VJ695900	JACK.PIN 3P
PJ82	VM750500	JACK.PIN 4P
PJ101	VJ696300	JACK.PIN 4P
PJ102	VJ696300	JACK.PIN 4P
PJ103	VJ696300	JACK.PIN 4P
Q1	iC287820	TR 2SC2878 A,B
Q2	VH964100	TR.DGT DTA143ES
Q3	iC260320	TR 2SC2603 E,F
Q4	iC260320	TR 2SC2603 E,F
Q5	iC260320	TR 2SC2603 E,F
Q6	VD678700	TR.DGT DTC114ES
Q7	iC260320	TR 2SC2603 E,F
Q8	iC260320	TR 2SC2603 E,F
Q9	iC260320	TR 2SC2603 E,F
Q10	iC260320	TR 2SC2603 E,F
Q11	iA101521	TR 2SA1015 Y
Q12	iC224030	TR 2SC2240 GR,BL
Q13	iC053540	TR 2SC535 A,B,C

\* New Parts

Schm Ref.	PART NO.	Description
Q14	iC224030	TR 2SC2240 GR,BL
Q81	iC260320	TR 2SC2603 E,F
Q101	iC287820	TR 2SC2878 A,B
Q102	iC287820	TR 2SC2878 A,B
Q103	iC260320	TR 2SC2603 E,F
Q104	VH964100	TR.DGT DTA143ES
Q105	iC287820	TR 2SC2878 A,B
Q106	iC287820	TR 2SC2878 A,B
Q107	VH964100	TR.DGT DTA143ES
Q201	VD488500	TR.DGT DTC143XS
△ Q202	VC938500	TR 2SC3852 (R)
R22	HV455180	R.CAR.FP 180Ω 1/4W
R23	HV455180	R.CAR.FP 180Ω 1/4W
R31	HV455150	R.CAR.FP 150Ω 1/4W
R33	HV455150	R.CAR.FP 150Ω 1/4W
R35	HV455150	R.CAR.FP 150Ω 1/4W
R37	HV455150	R.CAR.FP 150Ω 1/4W
R90	HV455150	R.CAR.FP 150Ω 1/4W
R91	HV455150	R.CAR.FP 150Ω 1/4W
R191	HV453220	R.CAR.FP 2.2Ω 1/4W
R192	HV453220	R.CAR.FP 2.2Ω 1/4W
R195	HV455220	R.CAR.FP 220Ω 1/4W
R196	HV455220	R.CAR.FP 220Ω 1/4W
R201	HV456560	R.CAR.FP 5.6KΩ 1/4W(R)
R202	HV456560	R.CAR.FP 5.6KΩ 1/4W(R)
R221	HV453100	R.CAR.FP 1Ω 1/4W
R222	HV453100	R.CAR.FP 1Ω 1/4W
R223	HL325120	R.MTL.OXD 120Ω 2W
R224	HL325120	R.MTL.OXD 120Ω 2W
R225	HL325120	R.MTL.OXD 120Ω 2W(UC)
R225	HL325150	R.MTL.OXD 150Ω 2W(RABG)
△ RY201	VE568900	RELAY DH12D1-OM (ABG)
△ RY201	VK539200	RELAY DH12D1-OM (UCR)
SW101	VM619700	SW.SLIDE SSSS92 (R)
△ * T201	Xi481A00	TRANS.PWR (UC)
△ * T201	Xi482A00	TRANS.PWR (AB)
△ * T201	Xi483A00	TRANS.PWR (G)
△ * T201	Xi790A00	TRANS.PWR (R)
△ * TE201	VP924000	OUTLET.AC 3P (UCR)
XL1	VD980900	RSNR.CRYS 14.3181MHz (UCR)
XL1	VF066800	RSNR.CRYS 17.7344MHz (ABG)
	BB069510	GND.MTL No.6951
*	VQ142600	P.C.B. MAIN (UCR)
*	VQ142700	P.C.B. MAIN (AB)
*	VQ142800	P.C.B. MAIN (G)
CB301	LB201880	HOLDER.FUS PC-FH1
CB302	LB201880	HOLDER.FUS PC-FH1

\* New Parts

MAIN P. C. B.

Schm Ref.	PART NO.	Description
CB303	LB201880	HOLDER.FUS PC-FH1
CB304	LB201880	HOLDER.FUS PC-FH1
CB305	LA002320	TERM.WRAP 3P i-TYPE P=7.5
CB306	VD004900	CN.BS.PIN PH i-TYPE 6P TE
CB307	VB858900	CN.BS.PIN PH L-TYPE 10P SE
CB308	VB858600	CN.BS.PIN PH L-TYPE 7P SE
CB309	LB919040	CN.BS.PIN XH L-TYPE 4P SE
CB310	LB919030	CN.BS.PIN XH L-TYPE 3P SE
CB311	LA002320	TERM.WRAP 3P i-TYPE P=7.5
CB312	LA002320	TERM.WRAP 3P i-TYPE P=7.5
C301	Vi862200	C.POLY 0.1uF 100V
C302	VK180800	C.EL 6800uF 16V
C303	Vi862200	C.POLY 0.1uF 100V
C304	Vi862200	C.POLY 0.1uF 100V
C305	VK180700	C.EL 4700uF 16V
C306	Vi862200	C.POLY 0.1uF 100V
C307	Vi862200	C.POLY 0.1uF 100V
C308	Vi862200	C.POLY 0.1uF 100V
C309	Vi862200	C.POLY 0.1uF 100V
C310	Vi862200	C.POLY 0.1uF 100V
C311	Vi862200	C.POLY 0.1uF 100V
C312	VQ119900	C.EL 10000uF 35V
C313	VQ119900	C.EL 10000uF 35V
C314	VQ120000	C.EL 10000uF 56V
C315	VQ120000	C.EL 10000uF 56V
C316	VK179200	C.EL 2200uF 6.3V
C317	Vi845900	C.EL 10uF 63V
C318	Vi845900	C.EL 10uF 63V
C319	Vi845900	C.EL 10uF 63V
C320	Vi845900	C.EL 10uF 63V
C321	Vi845900	C.EL 10uF 63V
C322	Vi845900	C.EL 10uF 63V
C323	Vi844900	C.EL 1uF 50V
C324	UT452470	C.PP 470pF 100V
C326	UT452470	C.PP 470pF 100V
C327	UT452470	C.PP 470pF 100V
C328	UT452470	C.PP 470pF 100V
C329	UT452470	C.PP 470pF 100V
C330	VH622100	C.EL 10uF 50V
C331	VH622100	C.EL 10uF 50V
C332	UT452100	C.PP 100pF 100V(UCRAB)
C332	UT653180	C.PP 1800pF 100V(G)
C333	VH574800	C.EL 47uF 100V
C334	UT453150	C.PP 1500pF 100V
C335	VH622100	C.EL 10uF 50V
C336	VH622100	C.EL 10uF 50V
C337	UT452100	C.PP 100pF 100V(UCRAB)
C337	UT653180	C.PP 1800pF 100V(G)
C338	VH574800	C.EL 47uF 100V
C339	UT453150	C.PP 1500pF 100V
C340	VH622100	C.EL 10uF 50V
C341	VH622100	C.EL 10uF 50V
C343	UT452100	C.PP 100pF 100V(UCRAB)

\* New Parts

Schm Ref.	PART NO.	Description
C343	UT653180	C.PP 1800pF 100V(G)
C344	VH574800	C.EL 47uF 100V
C345	UT453150	C.PP 1500pF 100V
C346	FU351220	C.MICA 22pF 500V
C347	UT451470	C.PP 47pF 250V
C348	Vi841800	C.EL 100uF 10V
C349	VH622200	C.EL 22uF 50V
C350	FU351220	C.MICA 22pF 500V
C351	UT451470	C.PP 47pF 250V
C352	Vi841800	C.EL 100uF 10V
C353	VH622200	C.EL 22uF 50V
C354	FU351220	C.MICA 22pF 500V
C355	UT451470	C.PP 47pF 250V
C356	Vi841800	C.EL 100uF 10V
C357	VH622200	C.EL 22uF 50V
C358	FU452100	C.MICA 100pF 500V
C359	FU452100	C.MICA 100pF 500V
C360	FU452100	C.MICA 100pF 500V
C361	FU452100	C.MICA 100pF 500V
C362	FU452100	C.MICA 100pF 500V
C363	FU452100	C.MICA 100pF 500V
C364	Vi844900	C.EL 1uF 50V
C365	UT454100	C.PP 0.01uF 100V
C366	Vi846900	C.EL 10uF 100V
C367	UT454470	C.PP 0.047uF 100V
C368	Vi846900	C.EL 10uF 100V
C369	UT454100	C.PP 0.01uF 100V
C370	UT454100	C.PP 0.01uF 100V
C371	Vi846900	C.EL 10uF 100V
C372	UT454470	C.PP 0.047uF 100V
C373	Vi846900	C.EL 10uF 100V
C374	UT454100	C.PP 0.01uF 100V
C375	UT454470	C.PP 0.047uF 100V
C376	UA654470	C.MYLAR 0.047uF 50V
C377	UA654470	C.MYLAR 0.047uF 50V
C378	UA654470	C.MYLAR 0.047uF 50V
C379	UA654470	C.MYLAR 0.047uF 50V
C380	Vi845600	C.EL 47uF 50V
C381	VH622100	C.EL 10uF 50V
C382	VH622100	C.EL 10uF 50V
C383	VH622100	C.EL 10uF 50V
C384	VH622100	C.EL 10uF 50V
C385	Vi845600	C.EL 47uF 50V
C386	Vi845600	C.EL 47uF 50V
C387	Vi845600	C.EL 47uF 50V
C388	FU452100	C.MICA 100pF 500V
C389	UA654100	C.MYLAR 0.01uF 50V
C390	UT452470	C.PP 470pF 100V
C391	FG211330	C.CE 33pF 50V
C392	Vi845600	C.EL 47uF 50V
C393	Vi845900	C.EL 10uF 63V
C394	Vi845900	C.EL 10uF 63V
C395	Vi845600	C.EL 47uF 50V

\* New Parts

## MAIN P. C. B.

Schm Ref.	PART NO.	Description
C396	FG211330	C.CE 33pF 50V
C397	UT452470	C.PP 470pF 100V
C398	UA654100	C.MYLAR 0.01uF 50V
C399	FU452100	C.MICA 100pF 500V
C400	FU452100	C.MICA 100pF 500V
C401	UA654100	C.MYLAR 0.01uF 50V
C402	UT452470	C.PP 470pF 100V
C403	FG211330	C.CE 33pF 50V
C404	Vi845600	C.EL 47uF 50V
C405	Vi845900	C.EL 10uF 63V
C406	Vi845900	C.EL 10uF 63V
C407	Vi845600	C.EL 47uF 50V
C408	FG211330	C.CE 33pF 50V
C409	UT452470	C.PP 470pF 100V
C410	UA654100	C.MYLAR 0.01uF 50V
C411	FU452100	C.MICA 100pF 500V
C412	Vi845900	C.EL 10uF 63V
C413	Vi845900	C.EL 10uF 63V
C414	Vi845900	C.EL 10uF 63V
C415	Vi845900	C.EL 10uF 63V
C416	UT454100	C.PP 0.01uF 100V(G)
C417	UT454100	C.PP 0.01uF 100V(G)
C418	UG444220	C.CE 0.022uF 50V(G)
C419	UG444220	C.CE 0.022uF 50V(G)
C420	UT454100	C.PP 0.01uF 100V(G)
C421	UG444220	C.CE 0.022uF 50V(G)
C422	UT454100	C.PP 0.01uF 100V(G)
C423	UT454100	C.PP 0.01uF 100V(G)
C424	UT454100	C.PP 0.01uF 100V(G)
C425	UT454100	C.PP 0.01uF 100V(G)
C426	Vi845900	C.EL 10uF 63V
C427	Vi845900	C.EL 10uF 63V
C429	Vi862100	C.POL.MTL 0.047uF 100V
C430	UG444220	C.CE 0.022uF 50V(G)
C431	UG444220	C.CE 0.022uF 50V(G)
C432	UG444220	C.CE 0.022uF 50V(G)
C433	UG444220	C.CE 0.022uF 50V(G)
C434	UA653330	C.MYLAR 3300pF 50V(G)
C435	UT452220	C.PP 220pF 100V
C436	UA653330	C.MYLAR 3300pF 50V(G)
C437	UA653330	C.MYLAR 3300pF 50V(G)
C438	UA653330	C.MYLAR 3300pF 50V(G)
C439	UA653330	C.MYLAR 3300pF 50V(G)
C440	UT452220	C.PP 220pF 100V
C441	UT452220	C.PP 220pF 100V
C442	VK179200	C.EL 2200uF 6.3V
△ D301	VH770800	DIODE 1SR139-100
△ D302	VH770800	DIODE 1SR139-100
△ D303	VH770800	DIODE 1SR139-100
△ D304	VH770800	DIODE 1SR139-100
△ D305	Vi711600	DIODE.BRG RBV-602 LF-A
△ D306	iH001130	DIODE.BRG D5FB20
△ D307	VH770800	DIODE 1SR139-100

\* New Parts

Schm Ref.	PART NO.	Description
D308	iF004600	DIODE 1SS133
D309	iF004600	DIODE 1SS133
D310	iF004600	DIODE 1SS133
D311	iF004600	DIODE 1SS133
D312	iF004600	DIODE 1SS133
D313	iF004600	DIODE 1SS133
D314	iF004600	DIODE 1SS133
D315	iF004600	DIODE 1SS133
D316	iF004600	DIODE 1SS133
D317	iF004600	DIODE 1SS133
D318	iF004600	DIODE 1SS133
D319	iF004600	DIODE 1SS133
D320	VG442500	DIODE.ZENR MTZJ24B 24V
D321	VG442500	DIODE.ZENR MTZJ24B 24V
D322	iF004600	DIODE 1SS133
D323	iF004600	DIODE 1SS133
D324	iF004600	DIODE 1SS133
D325	iF004600	DIODE 1SS133
* D326	VP779200	DIODE S2L20U
* D327	VP779200	DIODE S2L20U
* D328	VP779200	DIODE S2L20U
* D329	VP779200	DIODE S2L20U
△ F301	KB001520	FUSE 7.0A 125V(UCR)
△ F301	KB001760	FUSE 6.3A 250V(ABG)
△ F302	KB001520	FUSE 7.0A 125V(UCR)
△ F302	KB001760	FUSE 6.3A 250V(ABG)
IC301	iG092000	IC M5220L
IC302	iG092000	IC M5220L
L301	VC664100	COIL 0.95uH
L302	VC664100	COIL 0.95uH
L303	VC664100	COIL 0.95uH
L304	VK175800	COIL 1.5uH
L305	VK175800	COIL 1.5uH
L306	VK175800	COIL 1.5uH
L307	VK175800	COIL 1.5uH
PJ301	VL552600	JACK.PIN 1P
PJ302	VJ133600	JACK.PIN 2P
PJ303	VJ133600	JACK.PIN 2P
Q301	iC174020	TR 2SC1740S R,S
Q302	VH964100	TR.DGT DTA143ES
Q303	iC174020	TR 2SC1740S R,S
Q304	VD488500	TR.DGT DTC143XS
Q305	VK432900	TR 2SD1915F S,T
Q306	VK432900	TR 2SD1915F S,T
Q307	VK432900	TR 2SD1915F S,T
Q308	VK432900	TR 2SD1915F S,T
Q309	VK432900	TR 2SD1915F S,T
Q310	VK432900	TR 2SD1915F S,T
Q311	VK432900	TR 2SD1915F S,T
Q312	VK432900	TR 2SD1915F S,T
Q313	iA097000	TR 2SA970 GR,BL
Q314	iA097000	TR 2SA970 GR,BL
Q315	iC1815C0	TR 2SC1815 Y

\* New Parts

MAIN P. C. B.

DSP-A970

Schm Ref.	PART NO.	Description
Q316	iC1815C0	TR 2SC1815 Y
Q317	iC1815C0	TR 2SC1815 Y
Q318	iA097000	TR 2SA970 GR,BL
Q319	iA097000	TR 2SA970 GR,BL
Q320	iC1815C0	TR 2SC1815 Y
Q321	iC1815C0	TR 2SC1815 Y
Q322	iC1815C0	TR 2SC1815 Y
Q323	iA097000	TR 2SA970 GR,BL
Q324	iA097000	TR 2SA970 GR,BL
Q325	iC1815C0	TR 2SC1815 Y
Q326	iC1815C0	TR 2SC1815 Y
Q327	iC1815C0	TR 2SC1815 Y
Q328	VE198800	TR 2SC2705 O,Y
Q329	VE198700	TR 2SA1145 O,Y
Q330	iC224000	TR 2SC2240 GR,BL
Q331	VE198800	TR 2SC2705 O,Y
Q332	VE198700	TR 2SA1145 O,Y
Q333	VE198800	TR 2SC2705 O,Y
Q334	VE198700	TR 2SA1145 O,Y
Q335	iC224000	TR 2SC2240 GR,BL
Q336	VE198800	TR 2SC2705 O,Y
Q337	VE198700	TR 2SA1145 O,Y
Q338	VE198800	TR 2SC2705 O,Y
Q339	VE198700	TR 2SA1145 O,Y
Q340	iC224000	TR 2SC2240 GR,BL
Q341	VE198800	TR 2SC2705 O,Y
Q342	VE198700	TR 2SA1145 O,Y
△ Q343A	iX603580	TR 2SA1358
△ Q343C	iX603590	TR 2SC3421
△ # Q344A	iX632650	TR 2SA1633 D,E,F
△ # Q344C	iX632660	TR 2SC4278 D,E,F
* Q345	VQ282200	TR 2SC2459 GR,BL
△ Q348	iX603580	TR 2SA1358
△ Q348	iX603590	TR 2SC3421
△ # Q349A	iX632650	TR 2SA1633 D,E,F
△ # Q349C	iX632660	TR 2SC4278 D,E,F
* Q350	VQ282200	TR 2SC2459 GR,BL
△ Q353	iX603580	TR 2SA1358
△ Q353	iX603590	TR 2SC3421
△ # Q354A	iX632650	TR 2SA1633 D,E,F
△ # Q354C	iX632660	TR 2SC4278 D,E,F
* Q355	VQ282200	TR 2SC2459 GR,BL
△ Q358	iA097000	TR 2SA970 GR,BL
△ Q359	iC1815C0	TR 2SC1815 Y
△ Q360	iA101521	TR 2SA1015 Y
* Q361	VQ282200	TR 2SC2459 GR,BL
* Q362	VQ282200	TR 2SC2459 GR,BL
* Q363	VQ282200	TR 2SC2459 GR,BL
* Q364	VQ282200	TR 2SC2459 GR,BL
△ Q365A	iX619590	TR 2SA1726 O,P,Y
△ Q365C	iX619600	TR 2SC4512 O,P,Y
△ Q366	iD043820	TR 2SD438 E,F
△ Q368	iB056020	TR 2SB560 E,F

\* New Parts

Schm Ref.	PART NO.	Description
△ Q369	iB056020	TR 2SB560 E,F
△ Q370A	iX619590	TR 2SA1726 O,P,Y
△ Q370C	iX619600	TR 2SC4512 O,P,Y
△ Q371	iD043820	TR 2SD438 E,F
△ Q373A	iX619590	TR 2SA1726 O,P,Y
△ Q373C	iX619600	TR 2SC4512 O,P,Y
△ Q374	iD043820	TR 2SD438 E,F
△ Q376	iB056020	TR 2SB560 E,F
△ Q377	iB056020	TR 2SB560 E,F
△ Q378A	iX619590	TR 2SA1726 O,P,Y
△ Q378C	iX619600	TR 2SC4512 O,P,Y
△ Q379	iD043820	TR 2SD438 E,F
* Q381	VQ282200	TR 2SC2459 GR,BL
* Q382	VQ282200	TR 2SC2459 GR,BL
* Q383	VQ282200	TR 2SC2459 GR,BL
* Q384	VQ282200	TR 2SC2459 GR,BL
△ R307	HL315120	R.MTL.OXD 120Ω 1W
△ R356	HV455220	R.CAR.FP 220Ω 1/4W
△ R357	HV455220	R.CAR.FP 220Ω 1/4W
△ R364	HV455220	R.CAR.FP 220Ω 1/4W
△ R365	HV455220	R.CAR.FP 220Ω 1/4W
△ R372	HV455220	R.CAR.FP 220Ω 1/4W
△ R373	HV455220	R.CAR.FP 220Ω 1/4W
△ R374	VK188000	R.FUS 150Ω 1/4W
△ R375	HV457150	R.CAR.FP 15KΩ 1/4W
△ R376	VK189500	R.FUS 3.3KΩ 1/4W
R377	HV457150	R.CAR.FP 15KΩ 1/4W
△ R378	VK189100	R.FUS 1.2KΩ 1/4W
R379	HV457150	R.CAR.FP 15KΩ 1/4W
△ R380	VK188700	R.FUS 560Ω 1/4W
△ R381	HV455100	R.CAR.FP 100Ω 1/4W
△ R382	HV455680	R.CAR.FP 680Ω 1/4W
△ R383	HV454470	R.CAR.FP 47Ω 1/4W
△ R384	VK188000	R.FUS 150Ω 1/4W
R385	HV457150	R.CAR.FP 15KΩ 1/4W
△ R386	VK189500	R.FUS 3.3KΩ 1/4W
R387	HV457150	R.CAR.FP 15KΩ 1/4W
△ R388	VK189100	R.FUS 1.2KΩ 1/4W
R389	HV457150	R.CAR.FP 15KΩ 1/4W
△ R390	VK188700	R.FUS 560Ω 1/4W
△ R391	HV455100	R.CAR.FP 100Ω 1/4W
△ R392	HV455680	R.CAR.FP 680Ω 1/4W
△ R393	HV454470	R.CAR.FP 47Ω 1/4W
△ R394	VK188000	R.FUS 150Ω 1/4W
R395	HV457150	R.CAR.FP 15KΩ 1/4W
△ R396	VK189500	R.FUS 3.3KΩ 1/4W
R397	HV457150	R.CAR.FP 15KΩ 1/4W
△ R398	VK189100	R.FUS 1.2KΩ 1/4W
R399	HV457150	R.CAR.FP 15KΩ 1/4W
△ R400	VK188700	R.FUS 560Ω 1/4W
△ R401	HV455100	R.CAR.FP 100Ω 1/4W
△ R402	HV455680	R.CAR.FP 680Ω 1/4W
△ R403	HV454470	R.CAR.FP 47Ω 1/4W

\* New Parts

## MAIN &amp; DSP P. C. B.

Schm Ref.	PART NO.	Description
△ R404	HV453470	R.CAR.FP 4.7Ω 1/4W
△ R405	HV456470	R.CAR.FP 4.7KΩ 1/4W
△ R406	HV456100	R.CAR.FP 1KΩ 1/4W
△ R407	VJ787600	R.MTL.PLAT 0.22Ω+0.22 5W
△ R408	VK188400	R.FUS 330Ω 1/4W
△ R409	HV453470	R.CAR.FP 4.7Ω 1/4W
△ R410	HV453470	R.CAR.FP 4.7Ω 1/4W
△ R411	HV456470	R.CAR.FP 4.7KΩ 1/4W
△ R412	HV456100	R.CAR.FP 1KΩ 1/4W
△ R413	VJ787600	R.MTL.PLAT 0.22Ω+0.22 5W
△ R414	VK188400	R.FUS 330Ω 1/4W
△ R415	HV453470	R.CAR.FP 4.7Ω 1/4W
△ R416	HV453470	R.CAR.FP 4.7Ω 1/4W
△ R417	HV456470	R.CAR.FP 4.7KΩ 1/4W
△ R418	HV456100	R.CAR.FP 1KΩ 1/4W
△ R419	VJ787600	R.MTL.PLAT 0.22Ω+0.22 5W
△ R420	VK188400	R.FUS 330Ω 1/4W
△ R421	HV453470	R.CAR.FP 4.7Ω 1/4W
R436	VE009700	R.FUS 4.7Ω 1/4W
R437	HL314100	R.MTL.OXD 10Ω 1W
R438	HV453470	R.CAR.FP 4.7Ω 1/4W
R439	VE009700	R.FUS 4.7Ω 1/4W
R441	VE009700	R.FUS 4.7Ω 1/4W
R442	HL314100	R.MTL.OXD 10Ω 1W
R443	HV453470	R.CAR.FP 4.7Ω 1/4W
R444	VE009700	R.FUS 4.7Ω 1/4W
R446	HL314100	R.MTL.OXD 10Ω 1W
R447	HV453470	R.CAR.FP 4.7Ω 1/4W
R448	HV453470	R.CAR.FP 4.7Ω 1/4W
R449	HV453470	R.CAR.FP 4.7Ω 1/4W
R450	HV453470	R.CAR.FP 4.7Ω 1/4W
R451	HV453470	R.CAR.FP 4.7Ω 1/4W
R490	HV454100	R.CAR.FP 10Ω 1/4W
R491	HV454100	R.CAR.FP 10Ω 1/4W
R492	HV454100	R.CAR.FP 10Ω 1/4W
R493	HV454100	R.CAR.FP 10Ω 1/4W
△ R494	HV455150	R.CAR.FP 150Ω 1/4W
△ R495	HV456150	R.CAR.FP 1.5KΩ 1/4W
△ R496	VE869300	R.MTL.OXD 0.1Ω 2W
△ R497	HV456220	R.CAR.FP 2.2KΩ 1/4W
△ R498	HV455150	R.CAR.FP 150Ω 1/4W
△ R499	HV454100	R.CAR.FP 10Ω 1/4W
△ R500	HV454100	R.CAR.FP 10Ω 1/4W
△ R501	HV455150	R.CAR.FP 150Ω 1/4W
△ R502	VE869300	R.MTL.OXD 0.1Ω 2W
△ R503	HV456220	R.CAR.FP 2.2KΩ 1/4W
△ R504	HV456150	R.CAR.FP 1.5KΩ 1/4W
△ R505	HV455150	R.CAR.FP 150Ω 1/4W
△ R506	HV455150	R.CAR.FP 150Ω 1/4W
△ R507	HV456150	R.CAR.FP 1.5KΩ 1/4W
△ R508	VE869300	R.MTL.OXD 0.1Ω 2W
△ R509	HV456220	R.CAR.FP 2.2KΩ 1/4W
△ R510	HV455150	R.CAR.FP 150Ω 1/4W

\* New Parts

Schm Ref.	PART NO.	Description
△ R511	HV454100	R.CAR.FP 10Ω 1/4W
△ R512	HV454100	R.CAR.FP 10Ω 1/4W
△ R513	HV455150	R.CAR.FP 150Ω 1/4W
△ R514	VE869300	R.MTL.OXD 0.1Ω 2W
△ R515	HV456220	R.CAR.FP 2.2KΩ 1/4W
△ R516	HV456150	R.CAR.FP 1.5KΩ 1/4W
△ R517	HV455150	R.CAR.FP 150Ω 1/4W
R533	HL325470	R.MTL.OXD 470Ω 2W
R534	HL325470	R.MTL.OXD 470Ω 2W
R535	HL325470	R.MTL.OXD 470Ω 2W
R536	HL325470	R.MTL.OXD 470Ω 2W
R544	HL326150	R.MTL.OXD 1.5KΩ 2W
RY301	KC001940	RELAY DH24D2-OTM
RY302	KC001940	RELAY DH24D2-OTM
SW301	VM619700	SW.SLIDE SSSS92
SW302	VM619700	SW.SLIDE SSSS92
SW303	VJ769200	SW.SLIDE ESD-2764
TE301	VJ792600	TERM.SP 8P (UCRAB)
TE301	VK178900	TERM.SP 8P (G)
TE302	VJ792600	TERM.SP 8P (UCRAB)
TE302	VK178900	TERM.SP 8P (G)
VR301	VJ692700	VR.TRIM B330Ω
VR302	VJ692700	VR.TRIM B330Ω
VR303	VJ692700	VR.TRIM B330Ω
	BB069510	GND.MTL No. 6951
*	VQ143000	P.C.B. DSP (UC)
*	VQ143100	P.C.B. DSP (R)
*	VQ143200	P.C.B. DSP (AB)
*	VQ143300	P.C.B. DSP (G)
* CB603	VP362000	CN.BS.PIN FE 28P SE
* CB604	VP360400	CN.BS.PIN FE 12P SE
* CB605	VP360200	CN.BS.PIN FE 10P SE
CB606	VB858900	CN.BS.PIN PH L-TYPE 10P SE
CB607	VB858300	CN.POST PH 4P SE
CB608	VB858100	CN.POST PH 2P SE (UCRAB)
CB609	VB858200	CN.BS.PIN PH L-TYPE 3P SE
CB610	VB858200	CN.BS.PIN PH L-TYPE 3P SE (G)
C601	UT452470	C.PP 470pF 10V
C602	VJ599100	C.CE.TUBLR 0.1uF 50V
C603	UT452470	C.PP 470pF 10V
C604	UT452470	C.PP 470pF 10V
C605	UT452470	C.PP 470pF 10V
C606	UT452470	C.PP 470pF 10V
C607	UT452470	C.PP 470pF 10V
C608	VJ599100	C.CE.TUBLR 0.1uF 50V
C609	UT452470	C.PP 470pF 10V
C610	UT452470	C.PP 470pF 10V
C611	UT452470	C.PP 470pF 10V
C612	UT452470	C.PP 470pF 10V
C613	VJ599100	C.CE.TUBLR 0.1uF 50V

\* New Parts



DSP P. C. B.

Schm Ref.	PART NO.	Description
C618	UA653100	C.MYLAR 1000pF 50V
C619	Vi845900	C.EL 10uF 63V
C620	UA654110	C.MYLAR 0.011uF 50V
C621	UA654390	C.MYLAR 0.039uF 50V
C622	Vi841100	C.EL 220uF 6.3V
C623	Vi841100	C.EL 220uF 6.3V
C624	UT452100	C.PP 100pF 100V
C625	UT452100	C.PP 100pF 100V
C626	UT452220	C.PP 220pF 100V
C627	UT452220	C.PP 220pF 100V
C628	Vi844900	C.EL 1uF 50V
C629	UA653100	C.MYLAR 1000pF 50V
C630	Vi845900	C.EL 10uF 63V
C631	UA654110	C.MYLAR 0.011uF 50V
C632	UA654390	C.MYLAR 0.039uF 50V
C633	Vi842600	C.EL 100uF 16V
C634	Vi842600	C.EL 100uF 16V
C635	Vi844900	C.EL 1uF 50V
C640	FU351220	C.MICA 22pF 500V
C641	VH622000	C.EL 4.7uF 50V
C642	Vi845600	C.EL 47uF 50V
C643	VH622000	C.EL 4.7uF 50V
C644	Vi845600	C.EL 47uF 50V
C645	FU351220	C.MICA 22pF 500V
C647	Vi845900	C.EL 10uF 63V
C648	Vi845900	C.EL 10uF 63V
C649	VH622200	C.EL 22uF 50V
C650	VH622200	C.EL 22uF 50V
C651	VH622200	C.EL 22uF 50V
C652	VH622200	C.EL 22uF 50V
C653	VH622200	C.EL 22uF 50V
C654	VH622200	C.EL 22uF 50V
C655	VH622200	C.EL 22uF 50V
C657	Vi846000	C.EL 22uF 63V
C658	Vi845900	C.EL 10uF 63V
C659	Vi845600	C.EL 47uF 50V
C660	UB245100	C.CE.M.CHP 0.1uF 25V
C661	UB245100	C.CE.M.CHP 0.1uF 25V
C662	Vi845900	C.EL 10uF 63V
C663	Vi845600	C.EL 47uF 50V
C664	UA655150	C.MYLAR 0.15uF 50V
C665	Vi846000	C.EL 22uF 63V
C666	UB012270	C.CE.M.CHP 270pF 50V(G)
C666	UB052100	C.CE.M.CHP 100pF 50V(UCRAB)
C667	Vi842800	C.EL 330uF 16V
C668	Vi842800	C.EL 330uF 16V
C669	Vi230500	C.CE.M.CHP 3300pF 50V
* C670	UB052180	C.CE.M.CHP 180pF 50V
C671	Vi230100	C.CE.M.CHP 2200pF 50V
C672	Vi230100	C.CE.M.CHP 2200pF 50V
C673	Vi230500	C.CE.M.CHP 3300pF 50V
* C674	UB052180	C.CE.M.CHP 180pF 50V
C675	Vi230100	C.CE.M.CHP 2200pF 50V

\* New Parts

Schm Ref.	PART NO.	Description
C676	Vi230100	C.CE.M.CHP 2200pF 50V
C678	UB012330	C.CE.M.CHP 330pF 50V
C679	UB012270	C.CE.M.CHP 270pF 50V
C680	Vi846000	C.EL 22uF 63V
C681	UB012330	C.CE.M.CHP 330pF 50V
* C682	UB052180	C.CE.M.CHP 180pF 50V
C683	Vi230500	C.CE.M.CHP 3300pF 50V
C684	UB051100	C.CE.M.CHP 10pF 50V
* C685	UB052180	C.CE.M.CHP 180pF 50V
C686	Vi230500	C.CE.M.CHP 3300pF 50V
C687	UB051100	C.CE.M.CHP 10pF 50V
C690	Vi846000	C.EL 22uF 63V
C691	Vi846000	C.EL 22uF 63V
C692	Vi846000	C.EL 22uF 63V
C693	UB012270	C.CE.M.CHP 270pF 50V
C694	Vi846000	C.EL 22uF 63V
C695	Vi846000	C.EL 22uF 63V
C696	Vi846000	C.EL 22uF 63V
C697	UB012330	C.CE.M.CHP 330pF 50V
C698	UB051330	C.CE.M.CHP 33pF 50V
C699	UB051330	C.CE.M.CHP 33pF 50V
C700	UB051100	C.CE.M.CHP 10pF 50V
C701	UB051330	C.CE.M.CHP 33pF 50V
C702	UB051330	C.CE.M.CHP 33pF 50V
C703	UB051100	C.CE.M.CHP 10pF 50V
C704	Vi846000	C.EL 22uF 63V
C705	UB245100	C.CE.M.CHP 0.1uF 25V
C706	Vi845600	C.EL 47uF 50V
C707	Vi842800	C.EL 330uF 16V
C708	Vi230500	C.CE.M.CHP 3300pF 50V
C709	Vi230500	C.CE.M.CHP 3300pF 50V
C710	UB245100	C.CE.M.CHP 0.1uF 25V
C711	UB245100	C.CE.M.CHP 0.1uF 25V
C712	Vi845600	C.EL 47uF 50V
C713	Vi845600	C.EL 47uF 50V
C714	Vi845600	C.EL 47uF 50V
C715	Vi845600	C.EL 47uF 50V
C716	UB245100	C.CE.M.CHP 0.1uF 25V
C717	UB245100	C.CE.M.CHP 0.1uF 25V
C718	UB245100	C.CE.M.CHP 0.1uF 25V
C719	UB245100	C.CE.M.CHP 0.1uF 25V
C720	UB245100	C.CE.M.CHP 0.1uF 25V
C721	Vi841800	C.EL 100uF 10V
C722	Vi841800	C.EL 100uF 10V
C723	UA654100	C.MYLAR 0.01uF 50V
C724	Vi845600	C.EL 47uF 50V
C725	UA654100	C.MYLAR 0.01uF 50V
C726	UB245100	C.CE.M.CHP 0.1uF 25V
C727	Vi845900	C.EL 10uF 63V
C728	Vi845600	C.EL 47uF 50V
C729	Vi845600	C.EL 47uF 50V
C730	UB245100	C.CE.M.CHP 0.1uF 25V
C731	Vi845900	C.EL 10uF 63V

\* New Parts



## DSP P. C. B.

Schm Ref.	PART NO.	Description
C732	Vi844800	C.EL 0.47uF 50V
C733	UB245100	C.CE.M.CHP 0.1uF 25V
C734	Vi845600	C.EL 47uF 50V
C735	Vi841900	C.EL 220uF 10V
C736	Vi841200	C.EL 330uF 6.3V
C737	Vi845600	C.EL 47uF 50V
C738	VE632800	C.EL 0.047F 5.5V
C739	Vi842800	C.EL 330uF 16V
C740	UB245100	C.CE.M.CHP 0.1uF 25V
C741	UB245100	C.CE.M.CHP 0.1uF 25V
C742	VJ599100	C.CE.TUBLR 0.1uF 50V
C743	Vi846000	C.EL 22uF 63V
C744	VJ599100	C.CE.TUBLR 0.1uF 50V
C745	UT452100	C.PP 100pF 100V(UCRAB)
C745	UT452220	C.PP 220pF 100V(G)
C746	UT452100	C.PP 100pF 100V(UCRAB)
C746	UT452220	C.PP 220pF 100V(G)
C747	Vi230500	C.CE.M.CHP 3300pF 50V
C748	Vi230500	C.CE.M.CHP 3300pF 50V
C749	Vi844900	C.EL 1uF 50V
C750	UB052120	C.CE.M.CHP 120pF 50V
C751	UB052120	C.CE.M.CHP 120pF 50V
C752	UB052120	C.CE.M.CHP 120pF 50V
C753	UB052120	C.CE.M.CHP 120pF 50V
C754	UB052120	C.CE.M.CHP 120pF 50V
C755	UB052120	C.CE.M.CHP 120pF 50V
C756	UB052120	C.CE.M.CHP 120pF 50V
C757	UB052120	C.CE.M.CHP 120pF 50V
C758	UB052120	C.CE.M.CHP 120pF 50V
C759	UB052120	C.CE.M.CHP 120pF 50V
C760	UB052120	C.CE.M.CHP 120pF 50V
C761	UB052120	C.CE.M.CHP 120pF 50V
C762	UB052120	C.CE.M.CHP 120pF 50V
C763	UB052120	C.CE.M.CHP 120pF 50V
C764	UB052120	C.CE.M.CHP 120pF 50V
C765	UB052120	C.CE.M.CHP 120pF 50V
C766	UB052120	C.CE.M.CHP 120pF 50V
C767	UB052120	C.CE.M.CHP 120pF 50V
C768	UB052120	C.CE.M.CHP 120pF 50V
C769	UB052120	C.CE.M.CHP 120pF 50V
C770	UB052120	C.CE.M.CHP 120pF 50V
C771	UB052120	C.CE.M.CHP 120pF 50V
C772	UB052120	C.CE.M.CHP 120pF 50V
C773	UB052120	C.CE.M.CHP 120pF 50V
C774	UB052120	C.CE.M.CHP 120pF 50V
C775	UB052120	C.CE.M.CHP 120pF 50V
C776	UB052120	C.CE.M.CHP 120pF 50V
C777	UB052120	C.CE.M.CHP 120pF 50V
C778	UB052120	C.CE.M.CHP 120pF 50V
C779	UB052120	C.CE.M.CHP 120pF 50V
C780	UB052120	C.CE.M.CHP 120pF 50V
C781	UB052120	C.CE.M.CHP 120pF 50V
C782	UB052120	C.CE.M.CHP 120pF 50V

\* New Parts

Schm Ref.	PART NO.	Description
C783	UB014100	C.CE.M.CHP 0.01uF 50V
C784	UB245100	C.CE.M.CHP 0.1uF 25V
C785	UB245100	C.CE.M.CHP 0.1uF 25V
C786	Vi845600	C.EL 47uF 50V
D601	iF004600	DIODE 1SS133
D602	iF004600	DIODE 1SS133
D603	VG437400	DIODE.ZENR MTZJ5.1B 5.1V
D604	iF004600	DIODE 1SS133
D605	iF004600	DIODE 1SS133
D606	iF004600	DIODE 1SS133
D607	iF004600	DIODE 1SS133
D608	iF004600	DIODE 1SS133
D609	iF004600	DIODE 1SS133
D610	iF004600	DIODE 1SS133
D611	iF004600	DIODE 1SS133
D612	iF004600	DIODE 1SS133
D613	iF004600	DIODE 1SS133
D614	iF004600	DIODE 1SS133
D615	VG438200	DIODE.ZENR MTZJ6.8A 6.8V
D616	iF004600	DIODE 1SS133
D617	VG436700	DIODE.ZENR MTZJ4.3A 4.3V
D618	iF004600	DIODE 1SS133
D619	iF004600	DIODE 1SS133
* IC603	XM356A00	IC NJM2068LD
IC604	XB247301	IC uPC4570HA
IC605	XB247301	IC uPC4570HA
IC606	XB247301	IC uPC4570HA
IC607	XB247301	IC uPC4570HA
IC608	XG758A00	IC LC7823N
IC609	Xi112A00	IC AK5339
IC610	XL816A00	IC YSS223-K
IC611	XM049A00	IC TC51832AFL-10
IC612	XB247301	IC uPC4570HA
IC613	XB247301	IC uPC4570HA
IC614	XB247301	IC uPC4570HA
* IC615	XM359A00	IC M5238AL
* IC616	XM359A00	IC M5238AL
IC617	XB247301	IC uPC4570HA
IC618	XB247301	IC uPC4570HA
IC619	XB247301	IC uPC4570HA
IC620	XB247301	IC uPC4570HA
IC621	XG780A00	IC AN79N05
IC622	XA507A00	IC AN78N05
IC623	XJ757A00	IC NJM78L05A-T3
* IC624	XM569A00	IC HD6433248A82
IC625	XF494A00	IC LB1641
J831	RD250000	R.CAR.CHP 0 $\Omega$ 1/10W
L601	VA983600	COIL 220uH(G)
L602	VA983600	COIL 220uH(G)
PJ602	VJ696300	JACK.PIN 4P
PJ603	VJ696300	JACK.PIN 4P
PJ604	VK421600	JACK.PIN 4P
* Q601	VD303700	TR 2SC3326 A,B

\* New Parts

DSP P. C. B.

DSP-A970

Schm Ref.	PART NO.	Description
* Q602	VD303700	TR 2SC3326 A,B
* Q603	VD303700	TR 2SC3326 A,B
* Q604	VD303700	TR 2SC3326 A,B
Q605	VG721700	TR.DGT DTA144ES
Q606	VH964100	TR.DGT DTA143ES
Q607	iC174020	TR 2SC1740S R,S
Q608	iC174020	TR 2SC1740S R,S
Q609	VG722000	TR.DGT DTC144ES
Q610	iA093320	TR 2SA933S Q,R
R646	HV455100	R.CAR.FP 100Ω 1/4W
R647	HV455100	R.CAR.FP 100Ω 1/4W
R655	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R656	Vi198200	R.MTL.CHP 22KΩ 1/10W
R657	Vi199000	R.MTL.CHP 47KΩ 1/10W
R658	Vi195100	R.MTL.CHP 1.2KΩ 1/10W
R659	Vi196400	R.MTL.CHP 3.9KΩ 1/10W
* R660	Vi193500	R.MTL.CHP 270Ω 1/10W
R661	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R662	Vi197000	R.MTL.CHP 6.8KΩ 1/10W
R663	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R664	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R665	Vi197000	R.MTL.CHP 6.8KΩ 1/10W
R666	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R667	Vi195100	R.MTL.CHP 1.2KΩ 1/10W
R668	Vi196400	R.MTL.CHP 3.9KΩ 1/10W
* R669	Vi193500	R.MTL.CHP 270Ω 1/10W
R670	Vi199000	R.MTL.CHP 47KΩ 1/10W
R671	Vi198200	R.MTL.CHP 22KΩ 1/10W
R672	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R673	Vi199000	R.MTL.CHP 47KΩ 1/10W
R674	Vi199000	R.MTL.CHP 47KΩ 1/10W
R685	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R686	Vi199000	R.MTL.CHP 47KΩ 1/10W
R687	RD257100	R.CAR.CHP 10KΩ 1/10W
R688	RD257100	R.CAR.CHP 10KΩ 1/10W
R689	RD258100	R.CAR.CHP 100KΩ 1/10W
R690	RD258100	R.CAR.CHP 100KΩ 1/10W
R691	RD257100	R.CAR.CHP 10KΩ 1/10W
R692	RD257100	R.CAR.CHP 10KΩ 1/10W
R693	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R694	Vi199000	R.MTL.CHP 47KΩ 1/10W
R695	Vi197400	R.MTL.CHP 10KΩ 1/10W
R696	RD258470	R.CAR.CHP 470KΩ 1/10W
R697	Vi197700	R.MTL.CHP 13KΩ 1/10W
R698	Vi197400	R.MTL.CHP 10KΩ 1/10W
R699	Vi197700	R.MTL.CHP 13KΩ 1/10W
R700	Vi197400	R.MTL.CHP 10KΩ 1/10W
R701	Vi197700	R.MTL.CHP 13KΩ 1/10W
R702	RD259100	R.CAR.CHP 1MΩ 1/10W
R703	RD259100	R.CAR.CHP 1MΩ 1/10W
R704	Vi197500	R.MTL.CHP 11KΩ 1/10W
R705	Vi197500	R.MTL.CHP 11KΩ 1/10W
R706	Vi197500	R.MTL.CHP 11KΩ 1/10W

\* New Parts

Schm Ref.	PART NO.	Description
R707	Vi197500	R.MTL.CHP 11KΩ 1/10W
R708	Vi197500	R.MTL.CHP 11KΩ 1/10W
R709	Vi197500	R.MTL.CHP 11KΩ 1/10W
R710	Vi197500	R.MTL.CHP 11KΩ 1/10W
R711	Vi197500	R.MTL.CHP 11KΩ 1/10W
R712	Vi197500	R.MTL.CHP 11KΩ 1/10W
R713	Vi197500	R.MTL.CHP 11KΩ 1/10W
R717	Vi196800	R.MTL.CHP 5.6KΩ 1/10W
R718	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R719	RD259100	R.CAR.CHP 1MΩ 1/10W
R720	Vi197200	R.MTL.CHP 8.2KΩ 1/10W
R721	Vi197400	R.MTL.CHP 10KΩ 1/10W
R722	Vi196100	R.MTL.CHP 3.3KΩ 1/10W
R723	RD259100	R.CAR.CHP 1MΩ 1/10W
R724	Vi197400	R.MTL.CHP 10KΩ 1/10W
R725	Vi196800	R.MTL.CHP 5.6KΩ 1/10W
R726	Vi195700	R.MTL.CHP 2.2KΩ 1/10W
R727	Vi197400	R.MTL.CHP 10KΩ 1/10W
R728	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R729	Vi197700	R.MTL.CHP 13KΩ 1/10W
R730	Vi197400	R.MTL.CHP 10KΩ 1/10W
R731	Vi197400	R.MTL.CHP 10KΩ 1/10W
R732	Vi197500	R.MTL.CHP 11KΩ 1/10W
R733	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R734	Vi197400	R.MTL.CHP 10KΩ 1/10W
R735	Vi197500	R.MTL.CHP 11KΩ 1/10W
R736	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R737	Vi197400	R.MTL.CHP 10KΩ 1/10W
R738	HV453220	R.CAR.FP 2.2Ω 1/4W
R748	Vi195900	R.MTL.CHP 2.7KΩ 1/10W
R749	Vi198200	R.MTL.CHP 22KΩ 1/10W
R750	RD256220	R.CAR.CHP 2.2KΩ 1/10W
R751	Vi196100	R.MTL.CHP 3.3KΩ 1/10W
R752	Vi197200	R.MTL.CHP 8.2KΩ 1/10W
R753	Vi195900	R.MTL.CHP 2.7KΩ 1/10W
R754	Vi198200	R.MTL.CHP 22KΩ 1/10W
R755	Vi197400	R.MTL.CHP 10KΩ 1/10W
R756	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R757	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R758	Vi197700	R.MTL.CHP 13KΩ 1/10W
R759	Vi197400	R.MTL.CHP 10KΩ 1/10W
R760	Vi197400	R.MTL.CHP 10KΩ 1/10W
R761	Vi197400	R.MTL.CHP 10KΩ 1/10W
R762	Vi197400	R.MTL.CHP 10KΩ 1/10W
R763	Vi197400	R.MTL.CHP 10KΩ 1/10W
R764	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R765	Vi197400	R.MTL.CHP 10KΩ 1/10W
R766	Vi196600	R.MTL.CHP 4.7KΩ 1/10W
R767	HV453220	R.CAR.FP 2.2Ω 1/4W
R770	Vi197400	R.MTL.CHP 10KΩ 1/10W
R771	Vi197400	R.MTL.CHP 10KΩ 1/10W
R772	Vi192500	R.MTL.CHP 100Ω 1/10W
R773	Vi192500	R.MTL.CHP 100Ω 1/10W

\* New Parts

## DSP &amp; OPERATION P. C. B.

Schm Ref.	PART NO.	Description
R774	RD254100	R.CAR.CHP 10 $\Omega$ 1/10W
R775	RD255220	R.CAR.CHP 220 $\Omega$ 1/10W
R776	RD259100	R.CAR.CHP 1M $\Omega$ 1/10W
R777	Vi197200	R.MTL.CHP 8.2K $\Omega$ 1/10W
R778	Vi196400	R.MTL.CHP 3.9K $\Omega$ 1/10W
R779	Vi196400	R.MTL.CHP 3.9K $\Omega$ 1/10W
R780	Vi197200	R.MTL.CHP 8.2K $\Omega$ 1/10W
R781	RD258100	R.CAR.CHP 100K $\Omega$ 1/10W
R782	RD256330	R.CAR.CHP 3.3K $\Omega$ 1/10W
R783	HL314680	R.MTL.OXD 68 $\Omega$ 1W
R784	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R785	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
* R786	RD258620	R.CAR.CHP 620K $\Omega$ 1/10W
R787	HV453220	R.CAR.FP 2.2 $\Omega$ 1/4W
R789	RD256270	R.CAR.CHP 2.7K $\Omega$ 1/10W
R792	RD257560	R.CAR.CHP 56K $\Omega$ 1/10W
R793	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R794	RD257560	R.CAR.CHP 56K $\Omega$ 1/10W
R795	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R796	RD256470	R.CAR.CHP 4.7K $\Omega$ 1/10W
R797	HV453220	R.CAR.FP 2.2 $\Omega$ 1/4W
R798	HV453220	R.CAR.FP 2.2 $\Omega$ 1/4W
R799	HV453680	R.CAR.FP 6.8 $\Omega$ 1/4W
R800	RD256100	R.CAR.CHP 1K $\Omega$ 1/10W
R801	RD256560	R.CAR.CHP 5.6K $\Omega$ 1/10W
R802	RD256270	R.CAR.CHP 2.7K $\Omega$ 1/10W
R803	RD256560	R.CAR.CHP 5.6K $\Omega$ 1/10W
R805	RD258100	R.CAR.CHP 100K $\Omega$ 1/10W
R806	RD257330	R.CAR.CHP 33K $\Omega$ 1/10W
R807	RD259100	R.CAR.CHP 1M $\Omega$ 1/10W
R815	Vi197400	R.MTL.CHP 10K $\Omega$ 1/10W
R816	Vi197400	R.MTL.CHP 10K $\Omega$ 1/10W
R817	Vi193300	R.MTL.CHP 220 $\Omega$ 1/10W
R818	Vi193300	R.MTL.CHP 220 $\Omega$ 1/10W
R819	Vi198400	R.MTL.CHP 27K $\Omega$ 1/10W
R821	RD255150	R.CAR.CHP 150 $\Omega$ 1/10W
R822	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R823	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R824	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R825	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R826	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R827	RD257100	R.CAR.CHP 10K $\Omega$ 1/10W
R828	RD255470	R.CAR.CHP 470 $\Omega$ 1/10W
R829	RD255470	R.CAR.CHP 470 $\Omega$ 1/10W
R830	RD255470	R.CAR.CHP 470 $\Omega$ 1/10W
R831	RD255220	R.CAR.CHP 220 $\Omega$ 1/10W
R832	RD255220	R.CAR.CHP 220 $\Omega$ 1/10W
R833	RD255220	R.CAR.CHP 220 $\Omega$ 1/10W
R834	RD255220	R.CAR.CHP 220 $\Omega$ 1/10W
R835	RD259220	R.CAR.CHP 2.2M $\Omega$ 1/10W
R836	RD259220	R.CAR.CHP 2.2M $\Omega$ 1/10W
XL601	VK175200	RSNR.CE 11.28MHz
XL602	Vi951800	RSNR.CE 20MHz

\* New Parts

Schm Ref.	PART NO.	Description
	BB069510	GND.MTL No.6951
	VB966900	CN IMSA-6024
* VQ142300	P.C.B.	OPERATION (UCRAS)
* VQ142400	P.C.B.	OPERATION (G)
CB901	VB858900	CN.BS.PIN PH L-TYPE 10P SE
CB902	LB918020	CN.BS.PIN XH i-TYPE 2P TE
CB903	VD004500	CN.BS.PIN PH i-TYPE 2P TE
CB904	VD004600	CN.BS.PIN PH i-TYPE 3P TE
CB905	VD004600	CN.BS.PIN PH i-TYPE 3P TE
C901	FG213100	C.CE 1000pF 50V
C902	Vi845600	C.EL 47uF 50V
C903	Vi845600	C.EL 47uF 50V
C904	VG722100	C.EL 1uF 50V
C905	VJ599100	C.CE.TUBLR 0.1uF 50V
C906	FG213100	C.CE 1000pF 50V
C907	Vi845000	C.EL 2.2uF 50V
C908	Vi845000	C.EL 2.2uF 50V
C909	Vi845600	C.EL 47uF 50V
C910	Vi845000	C.EL 2.2uF 50V
C911	Vi845000	C.EL 2.2uF 50V
C912	VF466900	C.CE.TUBLR 470pF 50V
C913	VJ599100	C.CE.TUBLR 0.1uF 50V
C914	VF466900	C.CE.TUBLR 470pF 50V
C915	VJ599100	C.CE.TUBLR 0.1uF 50V
C916	Vi845000	C.EL 2.2uF 50V
C917	FU451100	C.MICA 10pF 500V
C918	FU451100	C.MICA 10pF 500V
C919	Vi845600	C.EL 47uF 50V
C920	Vi845600	C.EL 47uF 50V
C921	FU451100	C.MICA 10pF 500V
C922	FU451100	C.MICA 10pF 500V
C923	Vi845000	C.EL 2.2uF 50V
C924	FU451100	C.MICA 10pF 500V
C925	Vi845600	C.EL 47uF 50V
C926	Vi845600	C.EL 47uF 50V
C927	FU451100	C.MICA 10pF 500V
C928	Vi845000	C.EL 2.2uF 50V
C929	VJ599100	C.CE.TUBLR 0.1uF 50V
C930	Vi845200	C.EL 4.7uF 50V
C931	Vi846000	C.EL 22uF 60V
C932	Vi846000	C.EL 22uF 60V
C933	Vi845200	C.EL 4.7uF 50V
C934	Vi846000	C.EL 22uF 60V
C935	UA655100	C.MYLAR 0.1uF 50V
C936	FU351220	C.MICA 22pF 50V
C937	FU351220	C.MICA 22pF 50V
C938	UA655100	C.MYLAR 0.1uF 50V
C939	Vi846000	C.EL 22uF 60V
C940	FU351220	C.MICA 22pF 50V
C941	Vi845900	C.EL 10uF 60V

\* New Parts

OPERATION P. C. B.

Schm Ref.	PART NO.	Description
C942	UA654220	C.MYLAR 0.022uF 50V
C943	UA654220	C.MYLAR 0.022uF 50V
C944	Vi845900	C.EL 10uF 63V
C945	FU351220	C.MICA 22pF 500V
C946	VJ599100	C.CE.TUBLR 0.1uF 50V
C947	VJ599100	C.CE.TUBLR 0.1uF 50V
D901	Vi013600	LED(re) SLR-34VC3H3(G)
D902	iF004600	DIODE 1SS133
D903	iF004600	DIODE 1SS133
D904	iF004600	DIODE 1SS133
D905	iF004600	DIODE 1SS133
D906	iF004600	DIODE 1SS133
D907	iF004600	DIODE 1SS133
* D908	VP976900	LED(or) SLN-210DCT12
* D909	VP976900	LED(or) SLN-210DCT12
* D910	VP976900	LED(or) SLN-210DCT12
* D911	VP976900	LED(or) SLN-210DCT12
* D912	VP976900	LED(or) SLN-210DCT12
* D913	VP976900	LED(or) SLN-210DCT12
* D914	VP976900	LED(or) SLN-210DCT12
* D915	VP976900	LED(or) SLN-210DCT12
* D916	VP976900	LED(or) SLN-210DCT12
* D917	VP976900	LED(or) SLN-210DCT12
* D918	VP976900	LED(or) SLN-210DCT12
* D919	VP976900	LED(or) SLN-210DCT12
IC901	XB247301	IC uPC4570HA
IC902	XB247301	IC uPC4570HA
IC903	XB247301	IC uPC4570HA
* IC904	XM356A00	IC NJM2068LD
IC905	XB247301	IC uPC4570HA
IC906	iR023820	IC uPD74HC238C
JK901	VJ114000	JACK.PHONE M1659
* JK902	VP594600	CN.DIN 1P, S
* PJ901	VP594700	JACK.PIN 3P
* Q901	VP602400	TR 2SC4038 Q,R,S,E
* Q902	VP602500	TR.DGT DTC143XL
* Q903	VP602500	TR.DGT DTC143XL
* Q904	VP602400	TR 2SC4038 Q,R,S,E
* Q905	VP602400	TR 2SC4038 Q,R,S,E
* Q906	VP602400	TR 2SC4038 Q,R,S,E
* Q907	VP602400	TR 2SC4038 Q,R,S,E
* Q908	VP602400	TR 2SC4038 Q,R,S,E
R901	HV453330	R.CAR.FP 3.3Ω 1/4W
R902	HV453330	R.CAR.FP 3.3Ω 1/4W
R904	HV455100	R.CAR.FP 100Ω 1/4W
R905	HV455100	R.CAR.FP 100Ω 1/4W
SW901	VG392900	SW.TACT SKHVAA
SW902	VG392900	SW.TACT SKHVAA
SW903	VG392900	SW.TACT SKHVAA
SW904	VG392900	SW.TACT SKHVAA
SW905	VG392900	SW.TACT SKHVAA
SW906	VG392900	SW.TACT SKHVAA
SW907	VG392900	SW.TACT SKHVAA

\* New Parts

Schm Ref.	PART NO.	Description
SW908	VG392900	SW.TACT SKHVAA
SW909	VG392900	SW.TACT SKHVAA
SW910	VG392900	SW.TACT SKHVAA
SW911	VG392900	SW.TACT SKHVAA
SW912	VG392900	SW.TACT SKHVAA
U901	VF926500	L.DTCT GP1U501X
VR901	VJ781500	VR.MTR Y100KΩx7
* VR902	VP825400	VR 16KΩ
* VR903	VP825600	VR 20KΩ
* VR904	VP825500	VR MN30KΩ
	BB071360	SCR.TERM 8.3x13

\* New Parts

# Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 $\Omega$	HJ35 3100	HF85 3100	10 k $\Omega$	HF45 7100	HF45 7100
1.8 $\Omega$	HJ35 3180	*	11 k $\Omega$	HF45 7110	HF45 7110
2.2 $\Omega$	HJ35 3220	HF85 3220	12 k $\Omega$	HJ35 7120	HF85 7120
3.3 $\Omega$	HJ35 3330	HF85 3330	13 k $\Omega$	HF45 7130	HF45 7130
4.7 $\Omega$	HJ35 3470	HF85 3470	15 k $\Omega$	HF45 7150	HF45 7150
5.6 $\Omega$	HJ35 3560	HF85 3560	18 k $\Omega$	HF45 7180	HF45 7180
10 $\Omega$	HF45 4100	HF45 4100	22 k $\Omega$	HF45 7220	HF45 7220
15 $\Omega$	HJ35 4150	HF85 4150	24 k $\Omega$	HF45 7240	HF45 7240
22 $\Omega$	HF45 4220	HF45 4220	27 k $\Omega$	HJ35 7270	HF85 7270
27 $\Omega$	HJ35 4270	HF85 4270	30 k $\Omega$	HF45 7300	HF45 7300
33 $\Omega$	HF45 4330	HF45 4330	33 k $\Omega$	HF45 7330	HF45 7330
39 $\Omega$	HJ35 4470	HF85 4390	36 k $\Omega$	HF45 7360	HF45 7360
47 $\Omega$	HF45 4470	HF45 4470	39 k $\Omega$	HF45 7390	HF45 7390
56 $\Omega$	HF45 4560	HF45 4560	47 k $\Omega$	HF45 7470	HF45 7470
68 $\Omega$	HF45 4680	HF45 4680	51 k $\Omega$	HF45 7510	HF45 7510
75 $\Omega$	HF45 4750	HF45 4750	56 k $\Omega$	HF45 7560	HF45 7560
82 $\Omega$	HF45 4820	HF45 4820	62 k $\Omega$	HF45 7620	HF45 7620
91 $\Omega$	HF45 4910	HF45 4910	68 k $\Omega$	HF45 7680	HF45 7680
100 $\Omega$	HF45 5100	HF45 5100	82 k $\Omega$	HF45 7820	HF45 7820
110 $\Omega$	HJ35 5110	HF85 5110	91 k $\Omega$	HF45 7910	HF45 7910
120 $\Omega$	HF45 5120	HF45 5120	100 k $\Omega$	HF45 8100	HF45 8100
150 $\Omega$	HF45 5150	HF45 5150	110 k $\Omega$	HF45 8110	HF45 8110
160 $\Omega$	HJ35 5160	*	120 k $\Omega$	HF45 8120	HF45 8120
180 $\Omega$	HF45 5180	HF45 5180	150 k $\Omega$	HF45 8150	HF45 8150
200 $\Omega$	HF45 5200	HF45 5200	180 k $\Omega$	HF45 8180	HF45 8180
220 $\Omega$	HF45 5220	HF45 5220	220 k $\Omega$	HJ35 8220	HF85 8220
270 $\Omega$	HF45 5270	HF45 5270	270 k $\Omega$	HF45 8270	HF45 8270
330 $\Omega$	HF45 5330	HF45 5330	300 k $\Omega$	HF45 8300	HF45 8300
390 $\Omega$	HF45 5390	HF45 5390	330 k $\Omega$	HF45 8330	HF45 8330
430 $\Omega$	HF45 5430	HF45 5430	390 k $\Omega$	HJ35 8390	HF85 8390
470 $\Omega$	HF45 5470	HF45 5470	470 k $\Omega$	HF45 8470	HF45 8470
510 $\Omega$	HF45 5510	HF45 5510	560 k $\Omega$	HJ35 8560	HF85 8560
560 $\Omega$	HF45 5560	HF45 5560	680 k $\Omega$	HJ35 8680	HF85 8680
680 $\Omega$	HF45 5680	HF45 5680	820 k $\Omega$	HJ35 8820	HF85 8820
820 $\Omega$	HF45 5820	HF45 5820	1.0 M $\Omega$	HF45 9100	HF45 9100
910 $\Omega$	HF45 5910	HF45 5910	1.2 M $\Omega$	HJ35 9120	*
1.0 k $\Omega$	HF45 6100	HF45 6100	1.5 M $\Omega$	HJ35 9150	HF85 9150
1.2 k $\Omega$	HF45 6120	HF45 6120	1.8 M $\Omega$	HJ35 9180	HF85 9180
1.5 k $\Omega$	HF45 6150	HF45 6150	2.2 M $\Omega$	HJ35 9220	HF85 9220
1.8 k $\Omega$	HF45 6180	HF45 6180	3.3 M $\Omega$	HJ35 9330	HF85 9330
2.0 k $\Omega$	HJ35 6200	HF85 6200	3.9 M $\Omega$	HJ35 9390	*
2.2 k $\Omega$	HF45 6220	HF45 6220	4.7 M $\Omega$	HJ35 9470	HF85 9470
2.4 k $\Omega$	HJ35 6240	HF85 6240			
2.7 k $\Omega$	HF45 6270	HF45 6270			
3.0 k $\Omega$	HF45 6300	HF45 6300			
3.3 k $\Omega$	HF45 6330	HF45 6330			
3.6 k $\Omega$	HJ35 6360	HF85 6360			
3.9 k $\Omega$	HF45 6390	HF45 6390			
4.7 k $\Omega$	HF45 6470	HF45 6470			
5.1 k $\Omega$	HF45 6510	HF45 6510			
5.6 k $\Omega$	HF45 6560	HF45 6560			
6.8 k $\Omega$	HF45 6680	HF45 6680			
8.2 k $\Omega$	HF45 6820	HF45 6820			
9.1 k $\Omega$	HF45 6910	HF45 6910			

**1/4W Type**

HJ35 10mm

**1/4W type**

HF45

5mm

**1/6W type**

HF85